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A TALE OF AUTOBIOGRAPHICAL MEMORY  
DEVELOPMENT: NEW ZEALAND STYLE

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## Abstract

Autobiographical memories are for specific, personal past events that are of significance to an individual (Nelson, 1993). The social interaction model of autobiographical memory proposes that children begin learning about the relevance of personal memories through talking about the past with adults (Fivush, 1991). The current study investigated relations over time between maternal reminiscing style and children's own developing memory style, both with and independently of their mothers, from when the children were 19 months old. Relations between attachment quality and maternal and child conversational variables were also examined. Fifty-eight mother-child dyads discussed unique past events when the children were 19, 25, 32, and 40 months old. In addition, children participated in experimenter-child interviews about unique past events when they were 25, 32, and 40 months old. Children's language skills were measured at each timepoint. The mother-child attachment relationship was measured at the 19-month timepoint. The present research demonstrated that the developmental progression to children's independent verbal memory actually begins with children's early interest in participating in the conversations and maternal reminiscing style, which together elicit children's later shared memory elaborations. Subsequently, children's shared memory elaborations and maternal reminiscing style both contribute to children's later independent memory at approximately 3-1/2 years of age. The present results isolated children's early

interest in reminiscing as a crucial factor in initiating the social aspect of autobiographical memory. In contrast, to previous research, the current study did not find support for a simple socialisation path from mother to child (e.g. Reese et al., 1993), but rather demonstrated that bidirectional influences are present from the onset of mother-child conversations about the past.

The current study also examined the contribution that attachment status may have to the development of joint reminiscing. Securely attached children demonstrated a greater willingness to participate in these conversations about the past and subsequently produced more unique memory information in comparison to insecurely attached children. In conjunction with the first set of results, these findings indicate that attachment security may be important in the foundation of mother-child joint reminiscing. Finally, contingency analyses showed that mothers from securely attached dyads provided more memory question elaborations in response to children's indications that they were willing to participate in these conversations, in contrast to mothers from insecurely attached dyads who provided more repetitions. The most appropriate response to these placeholders would be to continue to provide information to assist children in co-constructing the event with the mother, rather than continuing to provide information that the child has already received. Overall, mothers from securely attached dyads appear to be structuring past event talk with their children in a manner that may be labelled as "sensitive" for this task.

In summary, the current study addressed the idea that autobiographical memory development is essentially a collaborative process with children significantly

contributing to the development of their own reminiscing style from its inception. A secure attachment relationship may also enable the progress of the development of joint reminiscing.

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“To those grand old Otago days”

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## List of Abbreviations

Maternal memory question elaborations	MQ-ELAB
Maternal yes-no question elaborations	YN-ELAB
Maternal statement elaborations	ST-ELAB
Maternal memory question repetitions	MQ-REP
Maternal yes-no question repetitions	YN-REP
Maternal statement repetitions	ST-REP
Maternal repetitions	REPS
Maternal confirmations	CONF
Children's memory elaborations	ME
Children's memory placeholders	PL
Children's memory repetitions	MR
Children's off-topic talk	OFF

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## Chapter One

### Overview

*"I have no data yet. It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts."*

Sherlock Holmes

(Sir Arthur Conan Doyle, 1888/1993, p. 25)

The autobiographical memory system consists of memories for specific, personal past events that are of significance to an individual (Nelson, 1993). The memories contained within this system allow an individual to tell others about his or her life history. Autobiographical memory serves a social function in that sharing our personal experiences with others allows us to form interpersonal bonds with them. Some theorists have proposed that the onset of autobiographical memory appears to be around the age of three to four years (Welch-Ross, 1995; Nelson, 1996). Children independently give their first coherent narratives about personal past experiences at this age (for a review, see Hudson & Shapiro, 1991; Fivush & Haden, 1997). Most adults' earliest memories also date back to when they were three to four years old (e.g. Dudycha & Dudycha, 1941).

How does this social memory system develop? One explanation is in the

form of a social interaction model (Hudson, 1990; Fivush & Reese, 1992). The social interaction theory of autobiographical memory arises from Vygotsky's (1978) and Rogoff's (1990) models of cognitive development through social interaction. Vygotsky (1978) and Rogoff (1990) theorized that development and learning occur first within social interactions, and are later incorporated and used by the child in similar situations. Initially, adults assist children in accomplishing tasks by showing them the skills needed to complete the activity. Children are then able to practice these skills with the support of an adult, and finally internalise them so that they can complete the task independently. The social interaction model of autobiographical memory proposes that children begin learning about the relevance of personal memories through talking about the past. This learning takes place within adult-child conversations about the past, which begin occurring soon after children begin to speak (e.g., Hudson, 1990; Miller & Sperry, 1988). Initially, adults provide most of the structure and information for a past event conversation with a child, allowing the child opportunities to repeat or evaluate the information, but the role of the child is minimal. Later on, children provide more information although the adult continues to provide the structure for the conversation (e.g., Hudson, 1990; Fivush, Gray, & Fromhoff, 1987). Children's ability to narrate a past event continues to develop throughout childhood (Fivush, Haden, & Adams, 1995; Hudson & Shapiro, 1991).

Previous research has also shown that adults differ in the way they discuss the past with children (e.g., McCabe & Peterson, 1991; Fivush, 1994). Most of this

research has been primarily with mothers. There appear to be two types of maternal style for discussing the past, which the research has documented. One style is an "elaborative, topic extending" form where the mother engages in a conversation with a great deal of detail to encourage the child to participate (Fivush & Fromhoff, 1988). The second style is labelled "repetitive", in that the mothers tend to repeat questions until the child answers the question, and give little additional information about the event (Fivush & Fromhoff, 1988). Further research has shown that children incorporate their parents' style of discussing past events into their own independent past event narratives (e.g. Hudson, 1990; Haden, Haine, & Fivush, 1997).

Research on the social origins of autobiographical memory has primarily focused on parent-child interaction within past event narratives. Yet the social relationship between parent and child has developed prior to the onset of past event conversations. In an attempt to broaden the focus of autobiographical memory development, this study also investigates other social factors that the participants bring to the past event conversations, including characteristics of the child (linguistic skills and gender) and dyadic features (mother-child attachment quality).

Nelson (1996) proposes that children's language must be examined as a mediator of cognitive skills such as memory. Language skill may be especially important when children first start engaging in memory conversations about the past from about 18 months of age (Eisenberg, 1985; Hudson, 1990; Miller & Sperry, 1988; Nelson, 1988). How dependent is children's verbal memory skill on their



expressive vocabulary level? In turn, how much of maternal reminiscing style is directly in response to children's language level? Previous research has provided mixed findings on this issue (e.g., Welch-Ross, 1997; Reese and Brown, in press).

Gender may be another child characteristic that relates to how mothers structure their style of discussing the past. Previous research has found differences in the way mothers and fathers are conversing with sons and daughters during their early years which implies that children are being taught to reminisce differently based on their gender. In support of this hypothesis, Reese, Haden, and Fivush (1996) found that girls were consistently recalling more novel information than boys over a 30-month period. These gender differences were already apparent in children's independent memory talk at the beginning of the study, however, so the antecedents to these gender differences are unclear.

The formation of social bonds between the primary caregiver and child is seen through the attachment relationship that emerges during the first year of life (Ainsworth, Blehar, Waters, & Wall, 1978). Towards the end of the first year infants are becoming mobile and learning to explore the environment. The attachment relationship acts to monitor and regulate the distance between the infant and caregiver. Secure-base behaviour allows the infant opportunities to engage in exploratory behaviour in situations where it is not necessary for the infant to remain close to the attachment figure. In situations that are more stressful to the child, the secure-base behaviours are activated to maintain proximity. Children who are unable to maintain a balance between proximity-seeking behaviour and exploration

are considered to be insecurely attached (Ainsworth et al. 1978). In contrast, dyads that are more securely attached exhibit a balance between proximity-seeking behaviour and exploratory behaviour. This balance allows for more positive interactions that are free from the constant caregiver monitoring required by insecurely attached infants. A secure attachment may therefore be expected to be a good context for facilitating learning and developing cognitive skills.

These patterns of attachment are observable during the first year of life. The balance between proximity-seeking and exploration behaviours changes as children grow older. Initially, children tend to engage in more proximity-seeking behaviour. Later on, however, children show greater exploration type behaviours, regardless of attachment status. Mental representations of the attachment patterns develop as the child approaches the third year of life (Bowlby, 1969/1984). These internal working models reflect the interactional history between the child and caregiver thereby creating expectations for the child of future interactions both with the caregiver and eventually with other people in the child's social environment (Bowlby, 1969/1984).

Previous research on the relation between attachment and cognition has found that while attachment is not related directly to cognitive tasks per se, it is associated with a more positive learning environment (e.g. Bus & van IJzendoorn, 1992). Attachment quality creates a positive environment where little discipline is required by the mother to keep the child on task (e.g. Matas, Arend, & Sroufe, 1978). As a result, the more securely attached a child is, the easier it is for the mother to initiate cognitive tasks, for example, past event conversations.

The goals of this research were to explore the nature of mother-child and experimenter-child memory conversations. The primary goal was to explore relations over time between maternal reminiscing style and children's own developing memory style, both with and independently of their mothers, from when the children were 19 months old. This starting age is earlier than previous longitudinal studies of children's autobiographical memory development. The second goal was to determine the degree to which characteristics of the children, namely, language skills and gender, were related to mother-child and independent memory reports. The third goal was to explore the contribution that dyadic characteristics, specifically attachment status, may have on memory conversations.

The literature will be reviewed in the following manner. Various theories of the development of autobiographical memory will be presented in chapter two. Chapter three will then focus on a more in-depth analysis of the social interaction model of autobiographical memory development. Chapter four will provide information regarding attachment theory and the development of the attachment relationship, and chapter five will review the research pertaining to the relations between attachment and cognition. Finally, the hypotheses and design of the current study will be presented in chapter six.

## Chapter 2

### Theoretical Perspectives of the Development of Autobiographical Memory

Freud discussing the workings of memory

*"...I started from the striking fact that a person's earliest childhood memories seem frequently to have preserved what is indifferent and unimportant, whereas (frequently, though certainly not universally) no trace is found in an adult's memory of impressions dating from that time which are important, impressive, and rich in affect."*

(Freud, 1901/1960, p. 43)

Freud was one of the first theorists to comment on the phenomenon of childhood amnesia, in which adults have difficulty recalling memories from the early childhood years. Researchers have since found that memories for personal events are typically not recalled until the third or fourth year of life (Dudycha & Dudycha, 1941; Waldfogel, 1948; Weiland & Steisel, 1958). Episodic memories are our memories for events that we have personally experienced (Tulving, 1972). Yet not all episodic memory is autobiographical in nature; only those events that carry some significance for an individual's life story constitute autobiographical

memories. Freud's writings highlight the fact that what is of personal significance to one's autobiography does not appear to be laid down in memory for later recall. What is the reason for this late development of autobiographical memory?

Freud's (1901-1905/1986) theory on the inaccessibility of autobiographical memories was that events were encoded from childhood and stored, yet they were unable to be retrieved because, according to Freud, they contained unacceptable implied sexual and aggressive content. Freud theorised that these memories were therefore repressed in the unconscious and did not decay over time, but instead were held in pristine condition to be recovered through psychotherapy. What memories are retrievable from childhood were argued by Freud (1901/1960) to be screen memories preserved for the relation these memories have to other repressed memories. The problem with this theory of infantile amnesia is that there is no evidence of pristine memories or selective blockage of memories, and following psychotherapy individuals do not show an increased recall of events from their childhood.

### Neurological Theories of Autobiographical Memory Development

The idea of multiple memory systems has provided the impetus for a neurological perspective on the late development of autobiographical memory. Damage to the hippocampus in humans has been shown to result in severe memory impairments. The effects of these lesions are shown in the much studied patient HM, who had his medial temporal lobes removed in an effort to cure epilepsy

(Scoville & Milner, 1957). HM was found to suffer both difficulty in acquiring new memories (anterograde amnesia), and difficulty in remembering events prior to his operation (retrograde amnesia). Despite these memory impairments, these patients have shown some spared memory abilities (Brooks & Baddeley, 1976; Cohen & Squire, 1980). Spared memory capabilities give support to the idea of the existence of multiple memory systems, in which the memories for facts and events (termed declarative memories) depend on the involvement of the hippocampus, while memories for skills and habits (termed procedural memories) are independent of the hippocampus (Squire, 1992). Evidence from amnesic patients has shown that despite damage to the medial temporal lobe, these patients are still able to learn new habits and skills, for example the tower of Hanoi and mirror drawing, yet are unable to remember facts and events (Brooks & Baddeley, 1976; Squire, 1992; Cohen & Squire, 1980). Studies with monkeys have shown similar memory impairments and spared memory abilities following medial temporal lobe lesions (e.g. Nadel & Zola-Morgan; Zola-Morgan & Squire, 1984).

The declarative and procedural memory systems are believed to mature at different rates. Procedural memory capabilities appear to be present early in life as shown through visual concurrent discrimination tasks with monkeys. In a visual concurrent discrimination task pairs of objects are presented to the animal, with one object of the pair always being reinforced if the animal chooses it while the other is never reinforced (Bachevalier & Mishkin, 1984). These objects are presented once a day until the animals score correctly on 90 out of 100 trials. Bachevalier and

Mishkin (1984) found that three-month old monkeys learned the task as quickly as adult monkeys. Similar studies have been obtained with children (Overman, 1990). In Overman's (1990) study, 12- and 18-month-old children were given a visual concurrent discrimination task, similar to that given to the monkeys in Bachevalier and Mishkin's study mentioned above. These children all learned the task at the same rate, with no observable age differences in the ability to learn the task. The ability to acquire a visual recognition task is reported to show the presence of habit or skill formation. Therefore procedural memory appears to be present in young children. The declarative memory system, however, is thought to mature later. In delayed nonmatching-to-sample (DNMS) studies, the animal needs to decide if an object has been seen before. The animal is presented with an object, then following a delay they are presented with the original object and a new object. They are only rewarded if they choose the new object. Bachevalier and Mishkin (1984) showed that one year old monkeys were still not learning the task at the rate of adult monkeys. Diamond (1990) and Overman (1990) have shown that children are unable to learn DNMS tasks until later in infancy. These studies found that children were not performing the DNMS tasks at a level equivalent with adults until they were aged between 21- and 32-months. These memory abilities appear to develop later than procedural memories. In accordance with this theory, adult monkeys with their hippocampus lesioned are also impaired on the DNMS tests implying that this task does measure declarative memory function (Zola-Morgan & Squire, 1986).

Together these studies can be argued to show that declarative memories, for example autobiographical memories, are unable to be recalled until the limbic system is mature, thus explaining the period of infantile amnesia.

The neurological maturation of the limbic system as a cause of infantile amnesia has since been disputed by researchers showing that infants are capable of recalling episodic memories (e.g. Rovee-Collier & Hayne, 1987; Fivush et al., 1987). Previous studies involving mobile conjugate reinforcement have shown that infants are indeed capable of maintaining long-term retention (Rovee-Collier & Hayne, 1987). Rovee-Collier and her colleagues have used a mobile conjugate reinforcement paradigm to explore infant memory. The aim of this methodology is for an infant to learn that through his/her kicking he/she will be reinforced through the movement of the mobile (Rovee-Collier & Hayne, 1987). The infants are then tested for immediate and delayed retention of their ability to move the mobile by measuring foot kicks in response to a non-moving mobile. Rovee-Collier's research has found that infant age is positively correlated with the length of retention, so younger infants forget sooner than older infants (Rovee-Collier & Hayne, 1987). Two- and three-month old infants were found to remember this event for up to 14 days. The retention interval increased if a reminder cue from the event was given prior to complete forgetting of the event (Rovee-Collier & Hayne, 1987). This research shows the long-term memory capabilities of infants. The mobile tasks have, however, been argued to show procedural rather than declarative memory, in that the infants are learning a skill rather than remembering an event (Mandler,



1990; Squire, Knowlton, & Musen, 1993). Rovee-Collier and colleagues argue against the mobile paradigm being a procedural task and indeed, against the existence of multiple memory systems. The studies conducted by Rovee-Collier and her colleagues show that infants' memory for mobiles is highly specific. For example, changes to the surroundings in which the infants were originally trained or slight changes to the mobile itself cause the infants to fail to recognise the mobile and therefore, no kicking to move the mobile is registered (Rovee-Collier, 1993). These findings do not lend support to the mobile memory task being simply a learned motor response that could occur in a variety of situations. Rovee-Collier argues for a continuous memory system that develops throughout infancy as supported by her research, which shows infants' ability to recall specific mobile events early in infancy. Fivush et al. (1987) studied 2-year-olds' memory for unique events that occurred in the recent and distant past. The children's memories were assessed through an experimenter-child conversation about these past events. All children were able to recall information about the distant past events that had occurred more than six months ago which shows children's ability for long term recall and the presence of declarative memory in two-year olds.

The deferred imitation studies by Meltzoff provide further evidence regarding the presence of declarative memory in infants. Deferred imitation is a non verbal memory task that requires more than the recognition that is required for habit formation. Deferred imitation involves infants being shown a sequence of actions with an object(s), a delay being imposed and then the infants being given the

opportunity to imitate the actions from memory (Meltzoff, 1988; 1995). These studies have both allowed and not allowed the infants to attempt immediate imitation prior to the delay. It may be argued that the infants allowed immediate imitation opportunities are encoding events as procedural memory. These studies showed that infants from as young as nine months showed significant retention regardless of the immediate imitation condition. Therefore infants are able to remember events at young ages and reenact them. Deferred imitation is not just recognition memory or reinforced learning. Further support is given by adult amnesics who are unable to successfully perform the deferred imitation tasks (McDonough, Mandler, McKee, & Squire, 1995). These individuals are also unable to verbally recall events. Therefore the deferred imitation studies provide evidence of infants' ability to form declarative memories irrespective of the changes in the central nervous system that may occur during early childhood. The neurobiological theory therefore does not appear to account for the period of infantile amnesia. Evidence from past research shows that young children do have episodic memories (e.g. Fivush, et al., 1987; Fivush & Hamond, 1990). The question is when and how does the autobiographical memory system differentiate to form a more specific form of episodic memory.

### Social-Cognitive Theories of Autobiographical Memory Development

More recent theories regarding early childhood memories have focused on the influence of cognitive factors and social factors on the formation of

autobiographical memories. Howe and Courage (1993) present the view that because autobiographical memory contains an individual's personal event history relating to his/her self, an understanding of self-concept is required prior to the development of an autobiographical memory system. If there is no recognition of a self that is separate from others then it may be argued that personal experiences are unable to be encoded as autobiographical memories because they are unable to reference the event to oneself.

Research on children's knowledge of self-concept has focused on visual self-recognition measured through children's reactions to their mirror images (e.g. Lewis, & Brooks-Gunn, 1979; Lewis, Brooks-Gunn, & Jaskir, 1985; Pipp, Fisher, & Jennings, 1987) and to pre-recorded and live video tapes of children (Brooks-Gunn & Lewis, 1984). These studies have shown that children will respond to rouge on their noses by touching their nose rather than the mirror image between 18- and 24-months. It was also not until 18-months that infants could distinguish between pre-recorded videos of self and other. These researchers argue that this behaviour is indicative of the ability to recognise oneself or their physical features. Howe and Courage propose that following the acquisition of self recognition between 18- and 24-months, children learn to use self-referential pronouns (e.g. I and me) and from this children progress quickly into discussing past event narratives and thereby into autobiographical memories. Howe and Courage (1993) argue for the cognitive development of self being the precursors to the development of autobiographical memory, emerging prior to the use of language.

In contrast, Fivush (1988) argues for the parallel development of self-concept and autobiographical memories. Fivush (1988) views the development of a sense of self as the timeline upon which an individual's personal autobiographical memories are organised. As infants begin to discuss events that occurred in a longer time frame, their understanding of self-concept is also being extended to understand that they also existed in the past and will exist in the future. The concept of self and past event memories develop together to coherently organise an individual's life story on a timeline and therefore complete the development of autobiographical memory.

An integrated model for the development of autobiographical memory is provided by Welch-Ross (1995; 1999a), including children's metacognitive abilities, understanding of self, and social factors contributing to autobiographical narratives. Welch-Ross argues for the integration of three separate theories on the development of autobiographical memory. First, children require certain metacognitive abilities before autobiographical memory can be encoded as such. Individuals need to know that they are personally experiencing an event for it to be encoded as an autobiographical memory. An individual needs to know the difference between experiencing an event and simply knowing about an event. This distinction is required so personally experienced events can be tagged as such and therefore be encoded into the autobiographical memory system. The origin of the event is required for an individual to encode the event. Gopnik and Graf's (1988) research shows that children progress from having a general understanding

of experienced events at three years, to being able to distinguish more specifically as to where they obtained the information about an event from at five years. So three-year-olds may not be able to distinguish between personally experienced events and events they have only been told about. Therefore the events are not encoded differently by three-year-olds while it appears that five-year-olds are able to differentiate the events.

Welch-Ross (1995; 1997; 1999a) argues that these metacognitive skills are but one of the prerequisites for the emergence of autobiographical memory. The use of past event narratives and the development of self are also required for the complete development of autobiographical memory. Conversations about the past between children and parents are seen by Welch-Ross as a motivator of autobiographical memory development. These conversations about personally experienced events allow children to understand that past event narratives are being used to represent the event. Children's narratives are influenced through the style parents use to communicate about the past to them. Some mothers ask for more detailed narratives by getting the child to provide more detailed information through their prompts (termed an elaborative style) (Fivush & Fromhoff, 1988). Other mothers repeat their questions until they have obtained a satisfactory answer (termed a repetitive style) (Fivush & Fromhoff, 1988). Follow-up studies have shown that children of elaborative mothers report more detail and in general recall more about events compared to children who experienced a repetitive style (e.g. Hudson, 1990). Research has shown that children may benefit from parental style from 24-

months onwards, in that children with more elaborative mothers tend to report more memory information at later ages (e.g., Fivush & Fromhoff, 1988; Hudson, 1990; Reese, Haden, & Fivush, 1993). Welch-Ross argues that social interaction aids the development of autobiographical memory.

The development of self is also thought to be necessary for autobiographical memory development in this model. Welch-Ross believes, in contrast to Howe and Courage (1993), that more than a physical sense of self is required. A psychological sense of self is also needed. One way the psychological sense of self develops is through the use of conversation about shared past events which allows the individual to understand that they existed in the past (Welch-Ross, 1995). Only when a complete self-concept has developed will memories be retained in the autobiographical memory system.

While Welch-Ross (1995; 1999a) integrates several of the theories used to account for autobiographical memory development, there appears to be an emphasis on the cognitive factors with little explication of the social factors and no mention of the unique influence of language.

### Socialisation Theories of Autobiographical Memory Development

Schactel (1947) and Neisser (1962) were some of the first researchers to view the development of autobiographical memory as resulting from socialisation processes. They believed that events experienced by children were encoded into memory by the use of schemata that allowed the event to be categorised into

memory to give the event meaning. As children grow older these schemata are modified. To recall events the original process that placed the event into memory is required, i.e. the original schema is needed to reconstruct the memory. Schacter and Neisser both argued that this is the reason for the inability to recall early events. The changes in children's schemata are considered to be the result of the development of language and the increasing socialisation of children by adults as they enter the education system. Society requires that children change their mode of thinking and increase their use of communicative language. These changes in schemata make the events of infancy inaccessible. The difficulty with this argument, however, is why one change in cognitive abilities between children prior to attending school and those attending school might result in the inaccessibility of past events, while later cognitive developments in middle childhood and early adolescence do not appear to make later childhood memories inaccessible. Another problem with this theory is that memories are recalled anywhere from two and a half years onwards and are told in a clear sequenced manner similar to an adult's account (e.g. Hudson, 1990).

White and Pillemer (1979) and Pillemer and White (1989) advocate the presence of two separate memory systems to explain the development of autobiographical memory between three and four years as a result of the distinct pattern of recalled memories. White and Pillemer (1979) argue that the research shows that no autobiographical memories are present in the first two years, followed by increasing although still small numbers of personal memories until the

late preschool years where there is a sudden plethora of autobiographical memories. According to White and Pillemer's (1979) theory, the first memory system is present from birth. White and Pillemer argued that this system is activated through emotions, situations, and people cues, and likewise the memories themselves are shown by emotions or behaviours. So when an infant sees someone whom they know, a memory of that person is activated and "expressed" through an emotion (e.g. a smile, a giggle), or a behaviour (e.g. waving, touching, or seeking closer contact). The second memory system is presumed to appear during early childhood and to be influenced by social factors (White & Pillemer, 1979; Pillemer & White, 1989). This system encodes personally experienced events in a narrative form as a result of the child tagging these events as being important for social interactions. These events are then accessible through social interaction. The development of this social memory system along with the development of language allows the infant to recount personal past events. In summary, White and Pillemer (1979) argue that infantile amnesia is the result of events being encoded differently into the two separate memory systems, and it is only the social memory system that is searched for early memories. Therefore early childhood memories are unable to be recalled because they are stored in a different memory system with a different encoding method.

Nelson (1988, 1993) and her colleagues also view the development of autobiographical memory as emerging from past event conversations that take place prior to the existence of the autobiographical memory system. Nelson



suggests, however, that the inability to recall early childhood events is because young children have only a general episodic memory (Nelson, 1993). When children encounter new events, the event is held in memory until either the event is reexperienced and therefore is retained for future reference to guide one's actions in that event or the memory is discarded. This may be seen as an efficient use of cognitive space. The beginning of past-event conversations about the past, however, signals a new development in memory for children. Parents and children begin discussing shared past experiences after the language level of the child is at a level capable of participating in past event narratives, typically during the second year of life onwards. Nelson (1993) argues that it is through these conversations regarding the past that children learn about the social importance of knowing about and therefore discussing the past. It is through these parent-child conversations that children first learn about the social function of memory and from this, experienced events become something to remember and value through sharing them with others. The development of language is therefore seen in this social interaction model as an important step in allowing individuals to share their memories and therefore comprehend the social function of autobiographical memory. The two phases of childhood memory that are mentioned by White and Pillemer (1979) support the social interaction theory in that the establishment of the autobiographical memory system is related to sharing personal memories through past event conversations which only take place later in childhood and then with increasing frequency.

If the social interaction theory of autobiographical memory development is

accurate, you would expect that autobiographical memories would be established earlier in cultures that value narratives of one's personal history. The socialisation goals of different cultures would be expected to influence autobiographical memory development. Research looking at these questions has been conducted (Mullen, 1994; Mullen & Yi, 1995; MacDonald, Uesiliana, & Hayne, 1999; Han, Leichtman, & Wang, 1998). Mullen (1994) found that Caucasian adults reported earlier childhood memories than Asian adults. Mullen (1994) concluded that in Asian cultures conformity to social standards rather than individuality is valued, while the converse is true for Western cultures. Therefore past event conversations may be used in Western cultures to encourage individuality and develop a sense of self. In support of this theory, Mullen and Yi (1995) found that Caucasian mothers and children discussed past events three times as often as Korean dyads did in naturally-occurring conversations. Also, Han et al (1998) found that American children talked more about themselves rather than others compared with Chinese and Korean children. Mullen and Yi (1995) found other differences in these conversations showed that Caucasian dyads used more references to thoughts and feelings of the child, and that typically the child was the central character. In contrast Korean mothers emphasised social roles and the social expectations of the child. In Asian cultures such conversations about personally experienced events may be seen as undesirable to talk about oneself. Therefore autobiographical memory maybe established earlier in Western cultures compared to Asian cultures because past event conversations are more culturally valued. In turn MacDonald,

et al. (1999) found that cultures with a greater emphasis on oral history telling, the New Zealand Maori, reported earlier memories than did Caucasians and again they found that Asians reported later personal memories. These studies support the role of socialisation goals in the establishment of autobiographical memory.

## Chapter Three

### **The Social Interactional View of the Development of Autobiographical Memory**

*“The present contains nothing more than the past and what is  
found in the effect was already in the cause”.*

Henri Bergson (1907/1922, p. 15)

The social interaction model of autobiographical memory development is supported by two decades of research examining past event discussions, in particular between parents and children. Previous research has explored many different facets of past event narratives, including parental style of conversing, children's contributions to the discussions, and gender differences (Hudson, 1990; Fivush & Fromhoff, 1988; Reese, et al., 1996). The early past event narrative studies revealed the role that adults play in the development of children's early autobiographical memory. The emphasis of the initial research in this area was that parental influences essentially produced the child's developing narrative abilities. The role of the child and the influence he/she may have on his/her parent's past event narratives was not considered as much until more recently. A historical perspective of the past event narrative research is presented in this review beginning with the Vygotskian theoretical framework on which it is based. The past

event narrative research illustrates Vygotsky's theory of learning through social interaction. Vygotsky (1978) theorised that learning occurs first in an interpersonal context, and then eventually in an intrapersonal context. In practice, a child begins to learn new tasks in conjunction with an adult. Initially, the adult heavily scaffolds the task, enabling the child to participate in an activity that is more advanced than he/she could independently achieve.

Vygotskian theory forms the theoretical basis for research on learning how to reminisce about one's personal past as shown in studies by Eisenberg (1985), Sachs (1983), and Engel (1986). Eisenberg (1985) studied two Spanish-speaking girls' past event conversations with other adults, from when they were two-years until they were three-years-old. The results indicated that at first the adult conversation partners initiated and provided the structure and content of the conversations, with the two girls being only required to provide minimal responses. Towards their third birthdays, however, the girls were less reliant on the structure of the conversation being provided by the adult, and were instead providing more information themselves without prompting. Sachs (1983) studied her daughter's conversations with her parents from one and a half years to three years of age. These observations showed that both parents would advance their language levels as the child's language skills progressed. The parents were in essence scaffolding conversations so the child could learn to use more complex language forms, for example, the past tense. In this study, the parents initially talked about the recent past while still in the context of it, for example, saying to the child "you spilt it"

immediately after the child had spilt something. The child imitated her parents at first in the use of new past talk. At 22-months she began to add -ed to verbs in her references to the immediate past. Over time, the parents began to introduce topics that occurred further back in the past giving many cues as they did so. For example, "did you play on the swing at Nanna's today?" Again, the child would imitate the past talk first and then later when she was 2-years-old she began independently referring to the earlier past. The structures used by the parents appeared to be teaching the child how to refer to the past in conversation.

Hudson (1990) studied her daughter from 21-months until 27-months in parent-initiated conversations about the past. She found that her structuring of the conversations changed over time. Initially she used a lot of verification questions that only required yes-no answers, requests for information and repetitions of information. Over time however, the use of yes-no questions decreased, while more information was given and evaluations of the child's responses increased. What was the reason for the change in the structure of the maternal conversation? Looking at the child's conversation longitudinally, the child initially gave a lot of yes-no responses at 21-months. At 24-months, she was giving fewer of these responses and instead was giving more spontaneous and requested information. At 27-months, the child was beginning to initiate the conversations, offering information and even asking memory questions of her own. Over time, the child is becoming more independent in the conversation. The mother scaffolds the conversations differently as the child's skills at participating increase. The child

first learns the structure of remembering and recounting the past, then the child participates in the discussion, and eventually begins to initiate conversations about the past by him/herself.

These studies, although exploratory in nature, show that essentially adults are teaching children how to discuss the past. Ratner (1984) supports the importance of social interaction in learning. Ratner studied the memory questions that mothers asked their 30-month and 42-month-old children during routine conversations. Following this, the children participated in two memory tasks. A concurrent relationship was found between the mothers' conversational memory demands and performance on the memory tasks, although only for the 42-month-olds. Yet when the memory tasks were given one year later, the relationship between the mothers' prior conversational memory demands and the children's current memory task performance was significant for all children. Mothers who had asked more memory-eliciting questions had children who performed better on standard memory tasks. The study supports Vygotskian theory showing social interaction to be important in guiding children's cognitive development, in this case, memory development.

In the first of many studies uncovering differences in parental style of discussing the past, Engel (1986) found two distinct conversational styles were present in mothers. Engel observed mother-child dyads in a cross-sectional study conversing about past events. The children were aged between 19-months and 30-months. Engel identified a reminiscing style in which the past event tended to be

discussed in detail with attention to the sequence of the event. Co-construction of the event also appeared to be a feature of the reminiscing style, where the child's contribution to the conversation is incorporated into the discussion. The other parental style that Engel observed, labelled practical remembering, involved conversations that referred repeatedly to the most salient items of the past event with few details given, and little evidence of the child's input being included in the discussion. The differences found in this study were not confined to the mothers alone. The different maternal styles of conversing about the past were also related to the children's recall of the event. Children of reminiscing-type mothers were shown to make more contributions to the conversation at younger ages and produced more recall of the event at older ages, compared to children of mothers with a practical-remembering style.

Fivush and Fromhoff (1988) studied the past event discussions of 32 month-olds with their mothers. They found similar differences in maternal style to those observed by Engel (1986). Fivush and Fromhoff classified the mothers as being either elaborative or repetitive in their style of past event narration. The elaborative mothers provided rich detailed descriptions of the events. These mothers would ask more memory questions, questions that often contained new information about the event. In contrast the mothers who used a repetitive style tended to repeatedly ask questions providing little new information. The repetitive style of memory talk seemed to be used by mothers to get specific answers regarding the event rather than an overall description of the event. These mothers appeared to be probing the



child's memory for specific content. The children of elaborative mothers, in contrast to children of repetitive mothers, recalled more information about the past events under discussion. The children of elaborative mothers were given the opportunity to recall more through the greater number of memory questions asked by the mothers. The detail given by the elaborative mothers also makes the conversation of more interest and therefore gives the child a reason to recall the event. Fivush and Fromhoff conducted contingency analyses on this sample to discover what influence the children's responses have on the following conversational turn by mother. They looked at the mothers' responses to a no response, a conversational turn without any memory information, and a memory response by the children. The only difference they found between the two groups of mothers was when the child was participating in the conversation but not recalling any information. Elaborative mothers were more likely to continue asking memory questions, in particular elaborative questions, than were repetitive mothers. This finding indicates that elaborative mothers in contrast to repetitive mothers will tend to pursue the past event discussion if their children continue to show interest in the conversation. The elaborative style appears to function both to elicit more memory information from children but also to maintain the conversation. The following two conversation examples taken from the current study show these two contrasting conversational styles.

Example of a mother talking to her 32-month old child about an outing to a playground, using an elaborative conversational style.

“....And then you and me and Rosie went somewhere special. Do you remember where I took you?

C: I'd a special slide.

M: A to a special slide, that's right. And whereabouts was the special slide?

C: At my kindy.

M: Good.

C: Tessa's kindy.

M: Tessa's kindy, that's right. And what colour was the slide?

C: Green.

M: Green. Good girl. And what else was there at the kindy?

C: I don't know.

M: Was there something else you climbed on?

C: I don't know.

M: You can't remember?

C: No.

M: Do you remember when we sat at the top of the slide, whose house we could see?"

In contrast another mother discussing a Teddy Bears' Picnic with her 32-month old child uses a less elaborative style.

M: There were some other kids there. Can you remember who they were?

C: Yeh.

M: Who?

C: Hayden.

M: No.

C: You tell me.

M: No at the teddy bear's picnic. You remember the other children.

C: You tell me.

M: Well.

C: Mitchell.

M: No.

C: Can you tell me?

M: No I'm not telling you anything."

The findings with regard to the presence of two distinct maternal narrative styles are robust in both naturally occurring and more structured conversations (Hudson, 1990; McCabe & Peterson, 1991; Reese, et al., 1993; Reese & Fivush, 1993). In summary, some mothers have a style labelled as elaborative, reminiscing, or topic-extending in which the mothers give detailed sequenced descriptions of the event, confirm their child's responses and ask many questions that contain new information. In contrast other mothers have been shown to have a repetitive, practical remembering, or topic-switching style. These mothers do not tend to give as much descriptive detail of the event, often repeat questions until the children give the answer they require, and the conversations tend to be shorter.

The past event narrative research, in addition, shows that mothers are indeed consistent over time in their style of reminiscing. Mothers are consistent over time in the maternal style they use with the same child when discussing shared or unshared past events (e.g. Reese et al., 1993; MacDonald, 1997; Reese & Brown, in press). Haden (1998) also found that maternal style was consistent across different siblings in the same families. The type of structures that the mothers used (e.g. high elaborative structures, low elaborative and repetitive, or declarative) with their 70-month-old children predicted the use of the same structure with their 40-month-old children, regardless of differences in the siblings' responses, language, and age. The maternal past event narrative style is therefore a stable construct across different conversation partners. The maternal past event conversational style appears to be a function of the importance that mothers place on sharing past event experiences, as shown by their use of the same style with all their children. This is supported by Haden and Fivush's (1996) finding that maternal conversational style was not consistent across different contexts. Haden and Fivush found that the style that mothers displayed in past event conversations was not related to their conversational style in a free play situation. The maternal past event narrative style therefore seems to be dictated by the value that mothers place on discussing the past rather than by a general personality trait.

#### Relationship between Mothers' and Children's Past Event Narratives over Time

The child is also an active participant in past event conversations and so their

role should be considered. As has been briefly mentioned above, verbal memory development of the child is associated with the maternal style of past event discussion (Fivush & Fromhoff, 1988; Hudson, 1990). Mothers who exhibit an elaborative style have children who are more responsive in past event conversations and who recall more information with the parents (Hudson, 1990; McCabe & Peterson, 1991; Peterson & McCabe, 1992; Reese & Fivush, 1993). These findings are, however, based on concurrent studies, which raise problems with the interpretation of the results. The directionality of the relationship between maternal narrative style and children's memory performance is unclear. Do children who have elaborative mothers remember more through acquiring her style, or do mothers become more elaborative because their children are recalling more? The relationship may also be bidirectional through both mother and child influencing each other. Longitudinal observations are needed to allow us to examine how the mother-child conversation changes over time. These longitudinal studies would permit us to observe how the maternal conversation changes in relation to the child's increasing participation, and also how children's recall is influenced by the mothers' narrative style.

Reese et al. (1993) sought to clarify the direction of the relationship through a longitudinal investigation of maternal style and children's developing memory skills. The study observed nineteen mother-child dyads over four time points between the ages of 40-months and 70-months. Mothers were separated into high elaborative and low elaborative groups, based on a ratio of each mother's total number of

elaborations divided by the total number of repetitions she used at the 40-month time point. Over the four time points the two groups remained distinctive from each other, with the high elaborative mothers using significantly more elaborations than repetitions in conversations. The low elaborative group, however, used fairly equal numbers of repetitions and elaborations. Over the 30-month time period, both groups significantly increased their use of elaborations. This finding indicates the interactional nature of maternal style. Mothers respond to their children's age-related increases in memory talk participation by increasing the demands of the task through elaboration questions. Reese et al. (1993) also found in concordance with other studies that children of high elaborative mothers were providing more new memory information in conversation than any other response. This was in contrast to children of low elaborative mothers who did not provide significantly more memory responses compared with other responses. The variation in memory recall between the two groups of children was not related to differences in language ability. This was shown by the similarity between the mean length of utterance and the length of the conversations by both groups of children.

Reese et al. (1993) then examined the relationship between mothers and children within the conversations. They found that all mothers displayed similar elaborative responses when their children were recalling information; however, the mothers differed when the child was taking a conversational turn without recalling information. High elaborative mothers were more likely to continue to elaborate and essentially keep the conversation going than low elaborative mothers. These

results replicated those from Fivush and Fromhoff's (1988) study. Together these findings suggest that highly elaborative mothers are encouraging their children to participate in shared memory talk. The issue of directionality was further advanced by exploring the concurrent and longitudinal relationship between the mothers' and children's talk over the 30-month period through cross-lagged correlations. Reese et al. (1993) found that maternal elaborations at 40-months contributed significantly to children's memory responses at 58- and 70-months. The more elaborative the mother was at the early time point, the more memory responses the child provided later. Children's early memory responses were not related to the later maternal style of discussing the past at the early time points. Therefore the early relationship between maternal style and children's developing memory is unidirectional from mother to child. Interestingly at the later age, 58-months, the children's memory responses predicted the maternal style at 70-months, therefore showing that a bidirectional relationship existed at the older ages.

Similar findings have been observed with younger children (MacDonald, 1997). MacDonald found the presence of the two narrative styles and again while the use of elaborations increased for all mothers over time, the two groups still remained distinctive. The children of high elaborative mothers provided more unique information compared with children of low elaborative mothers, again consistent with previous research. MacDonald (1997) found however, that the relation between maternal narrative style and children's developing narrative skills was bidirectional between 24-months and 40-months, at an earlier age than was

found by Reese et al. (1993). The reason for this discrepancy may be due to a number of factors. Reese et al. (1993) studied an American white middle class sample with a high average education level. In comparison, MacDonald (1997) studied a New Zealand white middle class sample, with a greater range of education levels. Conversations about the past may vary among different cultural groups, in terms of what beliefs are valued, and how important discussing past events is to different cultures. The discrepancy in these results are probably not due to cultural differences, however, as studies have found that both New Zealanders and Americans report their earliest memories at similar ages (MacDonald et al., 1999; Mullen, 1994). The autobiographical memory system is initiated at the same average age in both cultural groups. An alternative interpretation is that mother-child conversations about the past undergo several phases of mother-to-child and bidirectional influences with development. Research now needs to ascertain the possibility of mother-child directionality prior to 24 months in a New Zealand sample to replicate the pattern found in Reese et al. (1993). Thus, the early bidirectionality Macdonald observed may have occurred as children become able to talk, literally, about the past. Later, the activity may undergo another period of mother-to-child influence (from age 3 1/2 to 5 years) as children struggle with why they should talk about shared past events at all (see Reese & Brown, in press for similar arguments), followed by bidirectionality again.

Despite the discrepancies in the onset of bidirectional influences in mother-child past event conversations, these studies are a clear illustration of Vygotskian



theory. The mother's initial role is to provide the basic tools to introduce reminiscing, and to structure it to fit the child's ability. As the child becomes more competent, the mother alters the structure to further increase the child's abilities. This scaffolding is seen by the increase in elaborative utterances by the mothers and the increase in the children's contributions to the conversations over time, and therefore shows the mutual influence each participant's contribution has on the other. Vygotsky (1978) theorised that learning occurs first within social interactions. It is through practice and support by a competent adult that the child is able to internalise the skills needed to independently participate in the task. Therefore to examine the process of internalisation of narrative skills, the child needs to be observed over a period of time in contexts independent of the mother, for example in past event conversations with an unfamiliar adult.

### Children's Independent Past Event Narratives

What do children recall with an unrelated adult? How do children reminisce independently of their mothers? Tessler and Nelson (1994) investigated the independent narratives of 3- to 3/1/2-year-olds about a museum visit that they had participated in with their mothers. The children were asked to recall the event one week later with an unfamiliar researcher. Tessler and Nelson (1994) found style differences between mothers' conversations during the event, labelled narrative and paradigmatic. The mothers using the narrative style described the activity, used a number of references to other past experiences, and generally gave more

interpretive comments about objects in the museum. The paradigmatic style referred to those mothers who used a high proportion of categorisation comments (e.g. describing the properties of objects in the museum) and references to the child's knowledge base. These styles were found to be replicated by the children in their independent recall of the event. Children of mothers who used a narrative style also applied a narrative style in recalling the visit, whereas children of paradigmatic style mothers used a paradigmatic style when recalling the event. This study supports the notion that children internalise the narrative style of their mothers. The other issue raised by this study was the finding that children only recalled information that had been jointly discussed by both mother and child. What mothers and children discussed within the event influences what children independently recall. Tessler and Nelson (1994) did not, however, control for mother-child conversations about the event prior to the children's recall of the event with the experimenter. Do mother-child conversations about past events influence what the child recalls about the event independently? Are children's independent narratives simply repetitions of mother-child past event conversations about the event? Or does the child recall different aspects of an event with an unfamiliar person? A child may independently recall the joint conversation from the event as being the most important information for someone who was not there. In turn conversation with someone who was at the original event may result in different information being shared.

Hudson (1990) studied 24-month to 30-month-olds. Mothers discussed four

past events with their children four times. Two weeks later an experimenter asked the children about these four events and also about four new past events. Hudson found that the children recalled similar amounts of information for all events with the experimenter. It was not the case that children recalled more about events that had previously been discussed with their mothers. Rather, children of elaborative mothers were overall better able to respond to requests for information and to offer information to the experimenter. The children were not simply repeating information given to them by their mother in the conversations with the experimenter. Fivush and Hamond (1990), and MacDonald and Hayne (1996) found similar results with two and a half-year-olds and three year-olds respectively. In addition, Fivush (1994) observed children from three and a half years through until they were almost six years old discussing events first with their mothers and then with an experimenter, and again the same pattern was observed. These children did not incorporate the information given to them by their mothers about a particular event in the later interview with the experimenter. Children recall different information on recalling the event with an experimenter compared to when they discuss it initially with their mother, a pattern which holds throughout the preschool years.

McCabe and Peterson (1991) studied the past event conversations of two-year-olds with their mothers over a four month period. These same children were interviewed a year later when they were three and a half-years-old by an experimenter who prompted them to discuss past events. The study found that

when children were asked to independently recall a past event those children who had a mother with a topic-extending style produced longer recounts of the event, compared with children who had mothers with a topic-switching style. Further support is given by Fivush (1991) who found that children of elaborative mothers would produce a narrative with greater detail to an experimenter, while children of low elaborative mothers would supply the information asked for, but no more. The study implies that the children interpret the interviewer's questions in different ways as a result of the manner in which they have been taught to reminisce.

There are limitations related to these studies of children's independent narratives. Past research has not clarified the role of children's early participation in memory conversations with mothers or independently in accounting for these mother-to-child links to children's later independent memory. The current study examines children's independent memory conversations longitudinally as well as concurrently with mother-child past event conversations. With regard to independent memory conversations by the child, Vygotskian theory predicts that mothers' style of structuring memory conversations will contribute to children's later independent memory, showing that children have internalised the style presented to them by their mothers.

Peterson and McCabe (1994) elicited independent past event narratives from two-year-olds over an 18-month period. Parent-child past event conversations were also recorded during this time. Parents who prompted for more contextual information (e.g. when, where, who information) in earlier narratives had children

who provided more when and where information in their independent narratives with an experimenter. The only relationship between children's early and later independent narratives was children's "when" information at 26-31-months and their "when" information six months later (Peterson & McCabe, 1994). Although Peterson and McCabe (1994) conducted a longitudinal investigation of children's independent narratives with concurrent mother-child narratives, they did not examine the influence of the children's recall on the parents' narrative style. Peterson and McCabe (1994) only coded the children's independent narratives; they did not also code the children's utterances in the parent-child conversations. This research does not allow us to conclude how children's role in parent-child past event narratives might be related to their own independent narratives.

As children become more able conversation partners, mother and child appear to collaborate on the sharing of personal past experiences. Haden et al. (1997) conducted a longitudinal investigation of mother-child, and father-child past event narratives, and children's independent narratives with an experimenter, when the children were 40- and 70-months old. Parents increased the amount of narrative structure they provided over time for both daughters and sons. This included context information (e.g. location, time, people's names) and evaluative statements (e.g. personal feelings or emotional responses about the event, or comments that intensify the story). Children's use of these narrative structures also increased over time. The study also found that children's early use of evaluations in independent narratives with experimenters contributed to their later use of evaluations in

independent narratives. However, over and above the children's previous use of evaluations, mothers' use of evaluations at 40-months predicted children's use of evaluations at 70-months in independent narratives (Haden et al. 1997). The early past event reminiscing between parents and children is important for children's developing narrative skills. In summary, children seem to be taught not what to recall from their past, but rather how to structure their talk about the past.

### Role of Children's Language Abilities in Conversing about the Past

Language allows us to reminisce about our experiences and to recreate them for others. It is through language that we are able to preserve these past experiences by talking about them. Children learn from shared memory talk how to organise their experiences and tell their stories to listeners. These reminiscing skills are internalised for future use. Children acquire the structure for recalling personal past events rather than remembering units of information about specific past events from memory conversations. Several studies show that children recall different information with an experimenter than they did with their mother regarding the same event (e.g. Hudson, 1990; Fivush & Hamond, 1990; MacDonald, 1997). It is still important, however, to ascertain how dependent children's verbal memory skills are on their language skills. In turn, how much of maternal reminiscing style is directly in response to children's language level? Previous research both with younger and older children has produced mixed findings with regard to these questions. Welch-Ross (1997) found relations between children's language

development and verbal memory, but this study was with 4-year-olds and the only measure of language development was children's mean length of utterance (MLU) as calculated from the memory conversations. Reese and Brown (in press) found no relations between receptive language ability and mother-child memory conversations with 3-1/2- and 5-year-old children. Bauer and Wewerka (1995), however, found that 13- to 20-month-old children's expressive language at the time of encoding an event sequence predicted their later verbal memory for the event. Language skill may be especially important when children first start engaging in memory conversations about the past from about 18 months of age (Eisenberg, 1985; Hudson, 1990); Miller & Sperry, 1988; Nelson, 1988). At these younger ages, expressive language ability may be the critical aspect of language in the development of verbal memory. Hudson (1990) and Nelson and Ross (1980) predicted however, that even if expressive language is related to children's verbal memory, verbal memory will not be completely synonymous with language skill. Also, it appears that some inherent characteristic of the mother causes her to produce her narrative style, which is not completely reliant on her child's linguistic skills.

### Gender Differences in Past Event Narratives

The research pertaining to past event conversations has focused on the role of mothers in structuring the discussion and the ensuing memory development of the child. It is also important, however, to examine the manner in which fathers discuss

past events with children. Previous research on gender differences in conversations have indicated that males and females converse differently irrespective of age (Hirschman, 1994; Tannen, 1994). Research with adults has also demonstrated that women report richer memories of past events than do men, and date their earliest memories back to younger ages than do men (e.g. Cowan & Davidson, 1984; Mullen, 1994). Ross and Holmberg (1990) found in a study of married couples that both partners believed the wives' reports of landmarks in the relationship to be more vivid and more accurate than the husbands' reports. Ross and Holmberg (1990) interpreted these findings by proposing that women are socialised to be the keepers of the family history, and that women might place a higher value on reminiscing than do men. Do gender differences exist in parent-child conversations about the past? Reese and Fivush (1993) studied 40-month-olds from two-parent families reminiscing about unique past occurrences. The study showed no difference between mothers' and fathers' styles of discussing the past, and also no interaction between parents' gender and children's gender on parental style. Parents of daughters, however, were more elaborative in discussing the past compared to parents of sons. Girls talked more on average, gave more new memory information, and generally participated more in the conversations compared to boys. This study does not, however, allow us to assert the direction of these effects. Parents may be more elaborative with daughters due to gender-based expectations regarding the activity of reminiscing and therefore daughters may participate more. Alternatively, it may be that greater participation in the conversation by daughters



causes the parents to elaborate more.

To answer the issue of directionality Reese et al. (1996) studied the past event narratives given by these dyads longitudinally when the children were 70-months-old. The study found that mothers replied with evaluations and memory placeholders to a daughter's memory responses unlike mothers of sons. There was no such difference for fathers. Mothers appear to be structuring the activity differently depending on gender of the child. This finding may be the result of gender differences in the belief about the importance of reminiscing. Mothers may value discussing the past and ultimately life histories more so than fathers, and therefore structure the task to teach these socialisation goals to their daughters rather than to their sons. The differences in the way mothers and fathers are conversing with sons and daughters during their early years implies that children are being taught to reminisce differently based on their gender. In support of this, Reese et al. found that girls were consistently recalling more novel information than boys over the 30-month period. The girls and boys did not differ initially, however, in their contingent responses to parents' elaborations or repetitions, implying that parents are elaborating more with girls irrespective of the girls' participation. Gender differences in reminiscing seem to emerge early in childhood. In summary, the greater use of elaborations and evaluations by parents and in particular by mothers may be teaching their daughters how to recount the past in a rich and interesting manner. The girls then learn to give elaborate detailed accounts themselves and therefore may show the value they place on reminiscing in contrast

to boys who are not socialised to see recounting the past as an important or interesting activity.

Conversing about the past serves many purposes. It allows us to recount our life history to those who do not know us, and it strengthens bonds between those who do know us through reminiscing over shared events. Parents recalling the past with their children initiate the process of using reminiscing as a social activity that defines who you are to others. The manner in which parents discuss the past with their children may underlie their purpose of conversation. Parents who use an elaborative style seem more interested in recalling the past as seen through longer conversations and by engaging their children in the discussions through incorporating their contributions (e.g. Reese et al., 1993). Over time these children give more detailed and enriched narratives too. These parents would appear to view past event discussions as an activity that is to be socially valued. Parents who use a repetitive style appear to view past event narratives as a memory test and therefore try to elicit specific answers from the children. The research unequivocally supports that children come to comprehend the social function of autobiographical memory and to learn how to recount their personal life histories through the activity of reminiscing between parents and children.

In conclusion, although the existence of past event narrative styles of mothers has been confirmed, there are other issues that still remain unclear. The directionality of the relationship between parental narrative style and children's developing narrative abilities needs further attention. Neither Reese et al. (1993)

nor MacDonald (1997) have been replicated yet which poses a question about when bidirectionality in mother-child past event narratives actually does begin to occur. The research needs to examine mother-child conversations about the past before they actually begin occurring naturally and then to follow them longitudinally to answer these questions about when mothers and children begin to mutually influence each other's conversational style. The relationship between maternal style, children's narrative style with their mothers and their independent narratives has also not yet been examined in detail over time. Past research has not clarified the role of children's very early participation in memory conversations with mothers or independently in accounting for these mother-to-child links to later independent memory. It is important to determine how children's initial willingness to participate in these memory conversations may contribute to the patterns of conversation that have been observed. More research is needed that examines the longitudinal influences on past event narratives with a variety of different factors: for example, different social groups, children's age, children's language abilities, maternal education, culture and gender. However, it is important to remember that both mothers and children come to these memory conversations with previous experiences that may shape how they engage in these interactions. The aim of the next two chapters is to examine one particular dyadic factor that both mothers and children may bring to the past event conversations, namely the attachment relationship.

## Chapter Four

### Attachment Theory

*“If a community values its children it must cherish their parents”*

J. Bowlby (1951, p. 84).

Attachment theory was pioneered by John Bowlby and Mary Ainsworth. Bowlby conceptualised the theory over a number of years, heavily influenced by ethological theory and control systems theory (Bowlby, 1969/1984). In turn, Ainsworth (1963; 1979) empirically tested the theory of attachment and extended it through her naturalistic observations of mothers and their infants. Infant-mother attachment is defined as the enduring bond that develops between a child and his or her mother during the first year of life (Ainsworth, 1969; 1973). This bond is displayed by proximity-seeking and maintaining behaviours by both individuals (Bowlby, 1969/1984).

Before a detailed account of attachment theory and current attachment research is undertaken, a brief overview of the origins of the theory is required. Bowlby undertook training at the British Psychoanalytic Institute to specialise in child psychiatry. He found, however, that the psychoanalytic followers were unscientific in their theoretical approach as none of the psychoanalytic ideas was ever subjected to rigorous empirical testing (Bowlby, 1969/1984). Furthermore,

Bowlby believed that the environment played an important role in children's mental and emotional problems (Bowlby, 1969/1984). This was in opposition to the prevalent beliefs of the day. Melanie Klein (Mitchell, 1986) argued for the importance of fantasies as explanations for mental problems in children. Bowlby proposed these ideas in an era when children were being housed in orphanages because of the world wars, sent to sanatoria for quarantine purposes or were institutionalised for mental health problems. Bowlby and other researchers observed children who had been separated from, or deprived of maternal contact (Bowlby, 1944; 1951; Goldfarb, 1943; Bender & Yarnell, 1941). These qualitative studies reported that children deprived of their parents experienced physical, intellectual, and emotional problems. Bowlby concluded from these observations that for a child to grow up mentally and emotionally healthy, "the infant and young child should experience a warm, intimate, and continuous relationship with his mother (or permanent mother substitute) in which both find satisfaction and enjoyment" (Bowlby, 1951, p. 13). Bowlby felt that the drive theories of psychoanalysis did not describe the formation of this relationship nor were they supported by scientific literature (Bowlby, 1958; 1969/1984). Thus, from these observations of maternal deprivation "Attachment theory" was born (Bowlby, 1958). In 1958, Bowlby published his first version of attachment theory. He later reworked the theory and incorporated empirical evidence into the 1969/1984 edition.

Ethology influenced Bowlby's formulations of the attachment relationship,

especially studies by Lorenz (1937) and later Harlow (1961). These studies showed that attachment was not related to drive reduction, e.g. hunger or thirst, but that a social bond can form irrespective of whether basic needs are fulfilled by that individual. Harlow and Zimmerman (1958) and Harlow (1961) separated infant monkeys from their mothers after birth and left them with two surrogate mothers, one soft cloth surrogate and the other made of wire that was capable of feeding the infant. The time spent with each mother was recorded, both in general and in the presence of fearful stimuli. The studies showed that the infant monkeys preferred the soft cloth mother even though the wire mother provided the food. It was also the cloth mother to which the infant monkeys would run when presented with a fearful stimulus. The infant monkeys also showed signs of using the cloth mother as a secure base from which to explore the environment (Harlow & Zimmerman, 1958). These findings provided no evidence for the drive reduction theory of social relationship formation; rather it seems that comfort and contact time are more important than feeding for social bond formation.

Although both Harlow's monkeys and the children in institutions observed by Bowlby were having their physical needs met, e.g., food and shelter, they were deprived of emotional comfort. These observations gave Bowlby (1969/1984) the impetus to argue that there is an innate need for social interaction in infants. Bowlby (1969/1984) proposed that natural selection had played a role in the evolution of attachment, that is the selection of behaviour that aids a species' survival while discarding those behaviours that do not. He believed that it was

adaptive for infants to seek proximity to adults in potentially dangerous environments and so developed proximity-seeking behaviours to achieve this. Bowlby (1969/1984) proposed that there are several innate responses that developed in the first year of life that act to bind mother and child together. These responses include sucking, clinging, following, crying, and smiling. Bowlby believed these responses develop in the first six months and then become integrated and focused on the attachment figure during the second six months. Clinging and following were thought to be the most important for attachment behaviour (Bowlby, 1969/1984). Bowlby also reviewed separation responses by infants from their attachment figures (Bowlby, 1973). He believed that separation anxiety is experienced when attachment behaviour is activated but can not be terminated due to the absence of the attachment figure. Later in infancy, Bowlby argued that the infant develops expectant anxiety in those situations where the attachment figure is likely to become unavailable (Ainsworth & Bowlby, 1991).

The other perspective that influenced Bowlby was the theory of control systems. In essence, a control system acts to achieve a goal which is regulated by a feedback loop of inputs and output (Bowlby, 1969/1984). In terms of attachment, an infant's need for proximity (the goal) may be regulated by internal (e.g., illness, tiredness) and environmental factors (e.g., the familiarity of the surroundings). Furthermore the infant would need to conduct continual checks of the need for proximity. For example, in the presence of a stranger, the need for proximity to the attachment figure would increase and therefore proximity-seeking behaviour would

be activated. Once familiarity with the stranger is achieved, the proximity-seeking behaviour would decrease (Bowlby, 1969/1984). Bowlby (1969/1984; 1973) conceived that the attachment relationship is represented by an internal working model where mental representations of the self, attachment figure, and environments are held. The internal model is based on repeated patterns of interaction with the attachment figure. The internal model of attachment allows the child to form expectations of how the attachment figure will respond to them in future interactions i.e., will they be available and responsive when needed. So an infant who has a mental representation that his or her attachment figure is accessible and responsive to his or her attachment behaviour will not need to remain close to her in non threatening situations. The securely attached child will be confident that his or her attachment figure will respond to them when needed. An infant who is unsure of his or her attachment figure's accessibility or responsiveness may alter their proximity-seeking behaviour and remain close, to be assured that they will be accessible when the need arises.

### The Development of Attachment

During the first six months, infants have learned to distinguish familiar people from unfamiliar people. This is commonly shown through smiling and vocalising more in the presence of their mother (Bowlby, 1969/1984). The second half of the first year, when the infant becomes mobile, marks the onset of attachment through proximity-seeking behaviour, e.g. clinging, crying, and following their preferred



attachment figures. During this period, Bowlby proposed that the attachment behaviours are influenced by control systems, i.e., when the threat in the environment is non-existent the infant will explore the environment in the mother's presence; if danger is present in the environment then the infant will initiate proximity-seeking behaviours. Attachment is a reciprocal relationship whereby the cues that the attachment figure gives to the infant also monitor the infant's exploration and proximity. For example, an attachment figure may decrease the distance between the infant and herself if danger is present. The attachment relationship remains this way until the child's third year when a change occurs. Older children are able to endure predictable, short separations from their attachment figure. Bowlby (1969/1984) suggested that a "goal directed partnership" forms during this period which is activated by the cognitive development of being able to take another's perspective. This partnership, facilitated by language, allows the child and attachment figure to communicate to each other about their plans, allowing the other to understand and negotiate their own plans. The ability to understand what the other person plans to do aids the child to endure separations for longer periods.

During the time that Bowlby was formulating attachment theory, Ainsworth was empirically testing his theories, first in Uganda and later in Baltimore (Ainsworth and Bowlby, 1991). Ainsworth conducted a study on 28 mother-infant dyads in Uganda based on extensive naturalistic observations (Ainsworth, 1963). Ainsworth found evidence of infants' proximity-seeking behaviour toward the

mother when they were hurt, hungry, or when the mother left or moved away. She observed crying and attempts to follow the mother when separation occurred or was expected, and smiling or greetings on the mother's return, showing that an attachment had formed. Ainsworth used the phrase "secure base" to describe how children were using their attachment figure to explore the environment and to return to her for safety if danger is threatened (Ainsworth, 1963).

The observations of the Uganda sample led Ainsworth to identify two patterns of attachment: securely attached and insecurely attached. Infants who were considered to be securely attached would explore the environment while the mother was present, becoming distressed only when the mother left but would greet her positively on her return. Conversely the insecurely attached infants tended to cry a lot and explore little even when the mother was present. These infants would also cry on their mothers' return after a separation. These patterns were to be seen again later in Ainsworth's Baltimore sample which originally consisted of 26 mother-child dyads (Ainsworth, 1979; Ainsworth, et al., 1978). Through her extensive home observations of the dyads from the Baltimore sample, Ainsworth was able to clearly classify infant and maternal attachment behaviours. These home observations were extended with the inclusion of the Strange Situation assessment procedure of mother-infant attachment. Ainsworth and Wittig (1969) introduced one-year-old infants and their mothers from the Baltimore sample to a strange situation to study the attachment system under low and high stress conditions. The strange situation involved a series of separations and reunions

between mother and child in an unfamiliar setting with a stranger present. The mother and infant are introduced to a room with toys; after a period of time has elapsed, an unfamiliar woman enters the room, first talks with the mother, and then plays with the child. The mother then leaves the room briefly and returns. After another period of time both mother and stranger leave the situation. Finally the stranger first and then the mother return (Ainsworth & Wittig, 1969).

Together, the home observations and the strange situation procedure showed that mothers who responded consistently and promptly to their infants' signals (e.g. crying) in the first months of life, had infants who at the end of the first year cried relatively little and were securely attached (Ainsworth et al., 1978). In turn, these infants would be content to explore an unfamiliar environment in the presence of their mothers, however they were distressed by her departure, and were unable to be consoled by a stranger. Yet when the mother returned, they would seek proximity and were able to be quickly soothed by her (Ainsworth et al., 1978). These infants also appeared to use their mothers more often as a secure base in the home environment (Ainsworth et al., 1978).

In contrast, other infants appeared to be insecurely attached by the end of the first year, as observed both at home and in an unfamiliar situation. Two distinct categories emerged for infants classified as insecurely attached : insecure-avoidant and insecure-ambivalent (Ainsworth et al., 1978). The insecure-avoidant infants are categorised as such because they appeared indifferent to their mothers. They were not distressed when she left, or they were easily comforted by a stranger if

distressed, and these infants did not seek comfort from the mother on her return. The ambivalent-type infants tended to cling to the mother. When the mother left the room they were very distressed, and they were unable to be soothed by a stranger nor by the mother on her return.

The behavioural classifications that were obtained from the Strange Situation paradigm were validated against the extensive home observations that were conducted on the same dyads. At home, the securely attached infants were observed to cry less, exhibited less separation distress for everyday separations from mother, gave frequent positive greetings on reunion with mother, and frequent attempts to initiate physical contact with mother which the mother would freely give (Ainsworth et al., 1978; Ainsworth, 1979). In comparison, the two groups of insecurely-attached were characterised by more crying, more separation distress, and would not initiate being picked up as often by the mother, and would protest loudly at being put down (Ainsworth et al., 1978; Ainsworth, 1979).

Attachment theory places an emphasis on the role of the attachment figure in the development of attachment. Studies by Ainsworth and her colleagues have supported this assumption (Ainsworth et al, 1978). The original Baltimore sample showed that during the first year of life mothers of insecurely-attached infants were less responsive to crying by their infants. These mothers also acknowledged their child significantly less often compared with mothers of securely-attached infants following a separation, i.e. smiling, talking or approaching the infant (Ainsworth, 1979; Strayton & Ainsworth, 1973). Mothers of securely-attached infants were also

seen to be significantly more affectionate to their infants when holding them, e.g. kissing, hugging child (Ainsworth, 1979). Mothers of infants who were classified as avoidant more often picked up their infants while they were actively engaged in a task compared with mothers of secure and insecure-resistant infants (Ainsworth et al., 1978). Mothers of insecure-resistant infants tended to hold their infants when occupied with routines, e.g. feeding, changing, transporting compared with mothers of secure infants (Ainsworth et al., 1978).

Differences in general maternal characteristics were also seen between the groups. The mothers of securely-attached infants were shown to be more sensitive, accepting, co-operative, and accessible to their infants than mothers of insecurely-attached infants (Ainsworth, Bell, & Strayton, 1971). The mothers of insecurely-attached children were shown to display more insensitivity, rejection, and interference (Ainsworth et al., 1971; Ainsworth et al., 1978). These measures were made on 4 nine-point rating scales. Mothers who were classified as sensitive were able to respond to their infants' signals promptly, accurately, and appropriately (Ainsworth et al., 1971). Mothers who were classified as insensitive would, however, interpret the infants' signals in terms of the mothers' needs or would not respond to the infant at all. Mothers who would not often become irritable when their infants were angry or unresponsive were rated high on the acceptance-rejection scale. In contrast, rejecting mothers would show anger and resentment towards their infants at these times. The co-operation-interference scale would rate a mother as co-operative if she did not control and avoided interrupting her infant's

activities (Ainsworth et al., 1971). Mothers who were seen to be interfering would control their infants' behaviour more. Finally, the accessibility-ignoring scale measured mothers' abilities to attend to their infants' communication and signals even when busy or distracted (Ainsworth et al., 1971). Ainsworth and colleagues showed that mothers of avoidant infants picked up their infants in an abrupt interfering way and displayed less affectionate behaviour compared with other mothers. The mothers of the ambivalent children displayed delays in responding to crying, would carry out routines while holding the infant, and also displayed less affection to their infants.

Ainsworth and her colleagues concluded that maternal sensitivity and responsiveness to their infants' signals from early in children's development is the main contributor to the differences in mother-child attachment. Children who are identified as securely-attached have experienced interactions with mothers who are appropriately responsive to their signals, e.g. intervenes promptly when the child cries, gives physical contact when needed. In turn, these children develop a representation of their mothers as accessible and have confidence in her responsiveness to their cues. The securely attached child is able to explore the environment more freely, confident in the accessibility of his or her mother. A balance between exploration and proximity-seeking behaviour is able to be achieved. In contrast, insecure-resistant children have developed a representation of their mothers as insensitive and inconsistent to their signals. These children are not confident that their mothers will attend to them when needed, and therefore

these children are unable to use their mother effectively as a secure base, and thus choose to remain close to their mothers. The insecure-avoidant children develop a representation of their mothers as inaccessible and unresponsive to them. These mothers tend to reject physical contact and this may contribute to these infants avoiding their mothers. Therefore for insecurely attached children a balance between exploration and proximity seeking behaviour is not achieved.

The Baltimore study needs to be viewed as an exploratory study on the development of attachment. There are many methodological problems associated with this study. The sample of 23 dyads is too small to reveal reliable differences. There were six dyads classified as insecure-avoidant, and only four dyads in the insecure-resistant category. Lamb, Thompson, Gardner, and Charnov (1985) suggest that the ratings of maternal and infant behaviour in the home were confounded as they were based on the same observed behaviours. For instance, did persistent infant crying cause or result from maternal unresponsiveness? Consistent with this criticism, the intercorrelations between maternal rating scales were very high, ranging from 0.57 to 0.89 (Ainsworth et al., 1971) suggesting that these scales measured only one factor: how congruous the dyadic interactions were. Indeed when a factor analysis was conducted on three of the four rating scales (accessibility-ignoring was excluded), all of these variables loaded onto one factor (Ainsworth et al., 1971). Lamb et al. (1985) also commented on the biases that may have occurred because the same researchers observed each family for the one year period and yet interobserver reliability was not assessed.

## Post Bowlbian and Ainsworth Attachment Research

### 1. Predictors of Mother-infant Attachment Quality

Egeland and Farber (1984) confirmed Ainsworth et al. (1971) and Ainsworth et al.'s (1978) research on the influence of certain maternal characteristics in the development of the attachment relationship. Mothers of insecure-avoidant infants were less responsive to their infants' crying, avoided non-functional contact (e.g. cuddling) with their infants, and in general tended to be more irritable and less interested in their infants (Egeland & Farber, 1984). In turn, mothers of insecure-resistant infants appeared to lack knowledge about caregiving skills and were less sensitive to their infants' needs. Finally mothers of securely-attached infants were shown to be more sensitive to their infants, e.g. responsive to crying, feeding, cuddling, more affectionate, and showed less interference with their infants' activities (Egeland & Farber, 1984). These findings are consistent with the emphasis Ainsworth placed on the influence of maternal characteristics in the development of the mother-child attachment relationship.

### 2. Stability of Mother-infant Attachment Status

The original classification system devised by Ainsworth and Wittig (1969) comprised the three main categories: secure (typically 65% of dyads), insecure-avoidant (20% of dyads), and insecure-resistant (15% of dyads). Later eight subgroups were also identified which vary in the degree to which the infants display the characteristics of the main categories (Ainsworth et al., 1971). The infants in



the four secure subgroups differ in the level of proximity they require, with some requiring more contact with their attachment figure than others. The insecure-avoidant infants may show only avoidant behaviour, or they may display some proximity-seeking behaviours as well. Insecure-resistant infants may show active or passive proximity-seeking behaviour combined with resistant behaviour. The majority of the attachment research collapses across the subgroups and also often across the insecure classifications for statistical purposes to obtain power, as the subgroups and the insecure categories are often composed of small numbers of dyads. Subsequent research has also revealed a fourth type of attachment: insecure-disorganised (Main & Solomon, 1986). This category encompasses those infants whose behaviour was difficult to code as secure, insecure-avoidant, or insecure-resistant. These infants display behaviour that is disorganised or that shows no set pattern in the Strange Situation, and they often appear confused and anxious when the mother returns. Again the attachment literature often recategorises these dyads into a main category.

Subsequent studies in the attachment literature focused on replicating Ainsworth's findings. Ainsworth's Strange Situation procedure has proved to be a reliable assessment measure of the mother-infant attachment relationship from 12 to 24 months in the absence of any changes in family circumstances (e.g. Waters, 1978; Vaughn, Egeland, Sroufe, & Waters, 1979; Schneider-Rosen, Braunwald, Carlson, and Cicchetti, 1985; Thompson, Lamb, & Estes, 1982). In summary, attachment classifications from the Strange Situation appear to give us a "snapshot"

of the mother-infant relationship as it is at the time of assessment. Research has shown that between 53 and 96% of mother-infant dyads retain the same attachment classification over a six month period (e.g. Thompson et al., 1982; Waters, 1978). Changes in the family situation, and maternal and infant characteristics are proposed to influence the quality of attachment. These findings emphasise what Bowlby proposed over two decades ago, that attachment quality can change over time dependent on environmental changes (Bowlby, 1973).

### 3. New Attachment Methodology

Secure base behaviour is the most accurate measure of attachment security (Ainsworth, 1973). The infant's ability to use their attachment figure as a secure base from which to explore the environment, but to return to when necessary, is the hall mark of a secure attachment. Ainsworth (1973) emphasises the presence of secure base behaviour across situations as evidence of the formation of an attachment relationship rather than the occurrence of attachment behaviours (e.g. clinging, crying) which are more dependent on the situation. Over time attachment research has focused on the Strange Situation procedure to such an extent that Ainsworth's original emphasis on naturalistic observation of the mother-child relationship has been neglected. Although the Strange Situation can give reliable measures of attachment quality in the absence of any change in family circumstances (Waters, 1978), the Strange Situation procedure is a better indicator of the current attachment relationship. The Strange Situation is problematic,

however, because it only measures attachment under highly stressful conditions, and it is laboratory based. Although the Strange Situation has been extensively validated against home observations (Ainsworth et al., 1971), it is still not a naturalistic setting, and it requires caution in generalising to how mothers and their infants would act in everyday situations. Other limitations of the Strange Situation include the restricted age range of infants who can be validly observed and classified. Children older than two years would not experience the Strange Situation in the same way as younger children would, and therefore may be at risk of being incorrectly classified as insecure. Another disadvantage of this procedure is that the dyads are categorised into classifications, and some are forced into attachment categories (e.g. insecure-disorganised children). A continuum of security-insecurity scores might be a preferable measure. Finally, the Strange Situation procedure is not a research-friendly task as it requires extensive training in how to observe and score the infants' behaviours.

The development of a new assessment measure, the Attachment Q-set (AQS) by Waters and Deane (1985) has brought the focus of attachment research back to naturalistic observational methods. The AQS is designed to assess differences in secure base behaviour. The original AQS consisted of 100 statements about children's secure base behaviours. The AQS was later revised and reduced to 90 behaviours (Waters, 1987). The AQS relies on natural in-home observations of the infant's secure base behaviour. These 90 behaviours are sorted into 9 piles ranging from very characteristic of the child to not at all characteristic of

the child. The sort for the subject is then compared to a hypothetical sort for a secure child. The resulting correlation is the child's attachment security score. The AQS has a number of advantages over the Strange Situation procedure: it measures everyday secure base behaviour, the measure yields a score that fits into a secure-insecure continuum, and no children need to be forced categorised. Also, mothers are able to sort the measure, and the measure can be used on a wider age range of 1 to 5 years. The AQS taps into the cumulative history of the attachment relationship rather than just the attachment related reactions to one specific situation. The AQS is also grounded in attachment theory measuring the very behaviours that Ainsworth observed in Uganda and Baltimore (Ainsworth, 1963; Ainsworth et al., 1978).

The construct validity of the AQS has been empirically supported with research showing predicted associations with the Strange Situation (e.g. Vaughn & Waters, 1990; Bretherton, Biringen, Ridgeway, Maslin, and Sherman, 1989). Children classified as secure in the Strange Situation had higher AQS security scores compared to insecurely attached dyads for both observer and maternal sorts (but see van Dam & van IJzendoorn, 1988; van IJzendoorn, Vereijken, & Riksen-Walraven, in press). The central tenet of Ainsworth's attachment theory is that variations in maternal caregiving behaviour are important for predicting mother-infant attachment quality. These behaviours include maternal responsiveness to the infant's signals, both the appropriateness and promptness of these responses, and are termed maternal sensitivity. The predictive validity of the AQS has been

ascertained by examining the relation between maternal sensitivity and mother-infant attachment as measured by the AQS. These studies found strong positive relations between maternal sensitivity measured by Ainsworth's original maternal behaviour scales and other adapted measures of maternal sensitivity and the AQS regardless of whether it was sorted by mothers or observers (Pederson, Moran, Sitko, Campbell, Ghesquire, & Acton, 1990; Teti, Nakagawa, Das, & Wirth, 1991; Moran, Pederson, Pettit, & Krupka, 1992). Mothers from dyads who were more securely attached were considered by independent observers and themselves to show more behaviour that was positively affective, appropriate, and sensitively attuned to their child compared to mothers from dyads that were less securely attached.

One advantage of the AQS, unlike the Strange Situation, is that both mothers and observers are able to complete the sort. The question that needs to be answered then is whether mothers are able to objectively measure their children's behaviour, without social desirability biases entering their responses. Mothers are the ideal people to observe their children's behaviour because there are no time restrictions on the observation period and the children's natural behaviour and interaction with the mother are not altered by the presence of an observer. Also, mothers have access to their children's behaviour in a variety of situations unlike the observer. Teti and McGourty (1996) found that maternal and observer security scores derived from the AQS were significantly correlated. Also, observers' q-sorts converged more with the mothers' q-sorts when the observers were more confident

that they had observed a representative sample of the children's behaviour. This study and others (e.g. Pederson et al., 1990) support using mothers to sort the AQS. Teti and McGourty (1996) recommend that mothers become familiar with how the AQS items relate to their child's current behaviour, that a trained experimenter is present during the maternal sort to answer any questions, and to supervise the sort. Also, it is important that mothers are kept unaware of the construct that is being measured. Finally few studies have been conducted on the stability of the AQS, however, the available research is promising with both observer and maternal sorts showing moderate stability (Howes & Hamilton, 1992; Bretherton et al., 1989). More research is needed to discover the impact of environmental factors on the AQS security scores over time, as has been investigated with the Strange Situation.

In summary, this chapter has explored the theoretical and empirical origins of attachment theory. Proceeding from Bowlby and Ainsworth's contributions, many researchers have further developed procedures for assessing attachment and have searched for possibilities of the predictive value of attachment quality in children's developing social and cognitive skills. The advent of new assessment procedures involving naturalistic observation techniques have meant that attachment researchers have returned to the secure base of Ainsworth.

## **Chapter Five**

### **Relationship between Attachment Status and Cognitive Skills**

The attachment relationship between child and primary caregiver serves to create an internal working model of relationships (Bowlby, 1969/1984; Bowlby, 1973). This working model is a template that the child brings to all subsequent social interactions. The internal working model of attachment is a dynamic representation of the relationship between a child and his or her attachment figure. Over time this working model becomes increasingly complex, with the onset of language and more complex representational skills (Bretherton, 1987). The child learns to understand that their attachment figure can have their own goals and plans, and likewise so can the child. These changes can be seen by the child negotiating with their parents over impending separations rather than exhibiting proximity-seeking behaviours, e.g. clinging to parent. As the internal working model of attachment becomes more representational in nature, advances in children's cognitive abilities must also occur. Does the quality of the attachment bond influence children's developing cognitive abilities? This issue is relevant when Vygotsky's theory of cognitive development is considered. The theory emphasises the importance of social interaction between adults and children in shaping the development of children's cognitive skills. So where does attachment fit into the cognitive domain? A child who is securely attached uses their attachment figure as

a secure base from which to explore the environment. The securely attached child can be confident in the availability of the attachment figure. This enables uninhibited and independent exploration by the child. The attachment figures of securely-attached children are also less likely to interfere with the child's exploratory behaviour or activities as compared with mothers of insecurely attached children (Ainsworth et al., 1978). Finally, the atmosphere with securely attached dyads is generally more positive than that of insecurely attached dyads (Ainsworth et al., 1978). Attachment quality may mean that securely attached children are more willing to initiate new activities, e.g., problem-solving, and to persevere with them.

One could argue that insecure-avoidant children would also explore the environment as much as securely attached children. Although you would expect securely attached children to be more competent explorers of different environments because they are confident in the availability of their attachment figure if the need arose, in contrast the insecure-avoidant children are not able to be as confident in the accessibility of their caregiver. Securely attached children can expect sensitive timing from their mothers in offering help on problems unlike insecurely attached children. A caregiver from a securely attached dyad is more likely to offer assistance with the task that will be accepted by the child as a result of previous interactions. The positive atmosphere for securely-attached dyads may mean the interaction is more enjoyable, and asking for help may be less threatening. It may be proposed that in general, the nature of the secure-attached



dyads' relationship allows for a more adaptive learning environment compared with insecurely attached dyads. The relevance of attachment theory to cognitive development is a relatively recent research topic. Several different areas of cognition, however, have been examined: problem solving tasks, intelligence, language, self-recognition, theory of mind, and literacy. The empirical evidence from these studies will be presented next.

### Attachment and Problem-solving Tasks

In one of the early studies examining early attachment quality and later cognitive development, Matas et al. (1978) investigated relations between attachment and problem-solving abilities. Attachment quality was assessed when the children were 18 months old with the Strange Situation. Later problem solving abilities were examined when the children were two years old using tasks that required objects to be used as tools to solve the problem. Infants who were categorised as securely attached were shown to be more enthusiastic, and compliant to mothers' requests, and were also more positive on the problem solving task in general. These securely attached children also ignored their mothers less and spent less time away from the task compared with insecurely attached children. Matas et al. (1978) found securely attached children displayed less frustration behaviour, less verbal negativism, and less negative affect compared to insecurely attached children. Mothers of securely attached children were shown to be more attentive and supportive to their child's attempts at problem solving compared to

mothers of insecurely attached children. The mothers of securely attached children gained higher scores on quality of assistance compared to insecurely attached children. Quality of assistance indicated mothers who aided the child's ability to solve the problem through appropriately timed information and minimal assistance without solving the problem for the child. This study did not address whether securely-attached children actually solved the problem tasks more rapidly than the insecurely-attached children.

Frankel and Bates (1990) replicated Matas et al.'s (1978) study and found similar results. Mothers in securely attached dyads showed higher quality of assistance and support compared to mothers of insecurely attached children. Also, securely attached children displayed less off task behaviour, negative affect, and aggression compared to insecurely attached children. Both Frankel and Bates (1990), and Matas et al. (1978) have shown that securely attached dyads display more harmonious problem-solving interactions. These studies are limited by a lack of data concerning whether children's ability to solve the task differed as a function of attachment security.

van der Veer and van IJzendoorn (1988) assessed mother-child dyads in the Strange Situation when the children were two years old. These dyads were then observed in a problem solving task when the children were five years old. The task required the dyads to fit a series of circular containers together. The study conducted sequential analyses of the mother-child interactions to discover how sensitively the mothers were responding to their children's responses. The 19

mothers from securely attached dyads would give information either verbally or behaviourally when their children asked for advice. In contrast, the 13 mothers from the insecurely attached dyads were not as consistent in giving information when asked by their children. Thirty two dyads were classified as in marginal subgroups displaying some secure but also some insecure behaviours. These dyads had mothers who were more likely to respond with information to their children's requests for advice compared to mothers of insecure children, but not as much as securely attached mothers. This study extends the earlier attachment-problem-solving research by providing longitudinal data that indicates that mothers differ in the approach they use in a problem-solving task with their five year old children as a function of attachment security. Mothers of securely-attached dyads appear to facilitate their children's problem-solving abilities in a seemingly more sensitive manner than mothers from insecurely-attached dyads.

Moss, Parent, Gosselin, and Dumont (1993) observed a subsample of 42 month old children and their mothers engaging in a problem solving task that involved collecting items from a supermarket. Attachment security was assigned from a maternal Q-sort, with the lower third of the total sample classified as insecure children, and the top one third classified as securely attached. Therefore in this sample, 19 dyads were securely attached while 18 were insecurely attached. The study found that the two attachment groups did not differ on task performance but there were differences in the behaviours that they used to obtain the goal of the task. Securely attached children had a significantly higher level of on-task

behaviours compared to insecurely attached children. Mothers of securely attached children had higher verbal monitoring and evaluating of the children's behaviours (e.g. "is that the item we are looking for" p. 565) instead of non verbal behaviours (e.g. moving child's hand away from items that were not on list, p. 565) compared to mothers of insecurely attached children. Securely attached children displayed more monitoring and evaluation (e.g. repeating rules, checking what has been collected, and what needs to be done) verbal and non verbal behaviours compared to insecurely attached children. Securely attached dyads appeared to collaborate in a more effective manner to reach a joint goal. It is important to note that similar results were obtained in this study utilising the maternal Q-sort as in previous studies using the Strange Situation procedure.

Meins (1997) observed mothers and children in the Strange Situation when the children were 11 or 13 months old, and then in a box construction task when the children were three years old. Children were classified as securely attached (22) or insecurely attached (15). Again the two attachment groups did not differ in the time taken to complete the task; however, the manner in which the task was performed did differ between groups. Mothers of securely attached children made proportionately more positive comments on their children's performance, compared to mothers of insecurely attached children who made proportionately more negative comments about their children's endeavours. Physical intervention by the mothers, e.g. helping to construct the box, was more likely for mothers of secure children to be in response to requests for help from the child. In contrast mothers of insecurely

attached children were more likely to spontaneously physically intervene. Overall mothers of securely attached children were more sensitive in the aid that they gave their children compared to mothers of insecurely attached children. Sensitive feedback was defined as when mothers took account of their children's latest performance on the task and would give their feedback that was at the appropriate level, i.e. at a lower level if the child had failed the last action or at the same or higher level if the child had succeeded. Attachment, gender, and socioeconomic status were all independent in this sample.

In summary, the attachment and problem solving literature has found that mothers' reactions to securely attached children are generally more positive, consistent in their response and more supportive, and attentive to their children compared to mothers of insecurely attached children. In turn children from securely attached dyads are more positive, enthusiastic, and interested in problem solving tasks than insecurely attached children. The quality of the early mother-child relationship does play a role in children's subsequent cognitive development. The attachment and problem solving studies, however, have not focused on children's problem solving ability per se but rather the interaction between mother and child during the task. It is unclear how children's actual cognitive ability relates to attachment. Does the quality of the mother-child relationship uniquely predict later cognitive competence beyond other influential factors, e.g. maternal education or socioeconomic status? Estrada, Arsenio, Hess, and Holloway (1987) examined the affective quality of the mother-child relationship when the children were four

years old, and the children's concurrent and subsequent cognitive performance at ages 4, 5, 6, and 12 years. The affective quality of the mother-child relationship was measured by 6 criteria reflecting maternal and children's responsiveness to each other, willingness to compromise, concern for the others' needs or preferences, acceptance of child's characteristics by the mothers, emotional displays of affect, and discipline by mother. The study showed that the affective quality of the mother-child relationship at age four was related to children's concurrent and later cognitive abilities, e.g. language, mathematics, writing, irrespective of socioeconomic status or maternal intelligence. Also, mothers from dyads with more positively affective relationships were less negative, and less critical of errors made by their children in three interaction tasks. Children from dyads who were rated as being more positively affective were found to be more likely to persist in activities, choose challenging tasks, initiate new activities and were less likely to resist maternal assistance. Although this study did not directly measure attachment status, the affective quality dimension does appear to capture the quality of the attachment relationship.

Although this study controlled for maternal intelligence as a factor, it didn't directly address the possibility that securely attached children simply have better cognitive abilities (e.g. higher IQ), compared to insecurely attached children. Mixed results have been found on the relation between attachment quality and children's performance on intelligence tests. Matas et al. (1978) found that the scores on the Bayley Mental Developmental scales when the children were 23

months old were not significantly different for securely and insecurely attached children. In contrast, Main (1983) found that securely attached children aged 21 months gained higher intelligence test scores compared to insecurely attached children. van IJzendoorn and van Vliet-Visser (1988) also found that securely attached children performed better on a Dutch intelligence test at 5 years compared to children who were insecurely attached or in the marginal secure group. Unexpectedly, however, the insecurely attached children performed better than the secure marginal groups.

In a meta analysis, van IJzendoorn, Dijkstra, and Bus (1995) found only a weak association between attachment security and intelligence scores in 25 studies that included intelligence test measures. Only five out of twenty five studies found a direct relationship between attachment quality and intelligence test scores. It appears that securely attached children do not perform better in cognitive tasks because of greater general intelligence levels. It is noteworthy that Main (1983) also found that securely attached children co-operated more with the experimenter, and showed more positive affect and playfulness in the test. These qualities were found to be strongly related to the intelligence test scores. It can be argued that attachment security establishes a positive environment ( e.g. co-operativeness) that aids performance on cognitive tasks.

Another possibility is that the findings between attachment security and intelligence may only be of significance in high risk samples, e.g. low income, maternal psychiatric problems, low maternal education levels, or low social

support. Morisset, Barnard, Greenberg, Booth, and Spieker (1990) divided mothers from low socioeconomic status families into high and low risk groups on the basis of negative life experiences, social support, depression scores, and social skills. Children who were securely attached in the high risk group gained significantly higher scores on the Bayley Mental Developmental test compared to insecurely attached children in the same group. In the low risk group no difference in cognitive ability emerged between attachment groups.

Attachment quality may only relate directly to intelligence quotients as a protective factor in high-risk sub-groups. Specifically, a secure attachment relationship may promote children's cognitive development in a disadvantaged sample. In turn, securely attached children may perform better on cognitive tasks because of persistence and interest rather than because they are more intelligent.

### Attachment and Language Development

A few studies have examined the relationship between attachment quality and children's language abilities with promising results. Main (1983) found that securely attached children at 21 months used a greater number of different words during free play compared to insecurely attached children from a middle class sample. In Main's (1983) study, securely attached children used a greater number of words but they were also more interested in the free play session and explored more. Therefore, one might expect greater language use in this situation compared to the child who is insecurely attached and does not explore the toys as much. It is



unclear if on a standard vocabulary measure, these securely attached children would actually have obtained a greater vocabulary level, or if the attachment-exploration factor simply influences expressive language.

Morisset et al. (1990) found that children's language abilities at 3 years were significantly better for securely attached children in a low socioeconomic status high risk sample compared to insecurely attached children. In detail, they found that when the group was divided into subgroups of high and low risk, securely attached children had better language abilities, similar to the intelligence test findings above. The high risk subgroup comprised mothers who had a high score on any two of the following: depression, negative life experiences, lack of social support, or lack of social skills. The children in the low risk sub sample did not differ in their language abilities as a function of attachment security. These researchers view attachment as a protective factor that is influential in cognitive development only when there is a high risk environment, e.g. maternal depression, lack of social support for mother.

The relationship between early language abilities and attachment security was also investigated by Bretherton, Bates, Benigni, Camaioni, and Volterra (1979) with a mixed sample of American and Italian children. Bretherton et al. (1979) found no relationship between children's 10-12 month comprehension or production as measured by observers and maternal report. There was a relationship, however, between attachment status and children's 11-12 month non verbal communications, e.g. pointing to objects, with securely attached children displaying more of these

gestures compared with insecurely attached children. The relationship between attachment security and verbal language abilities may not be present at 12 months, but instead may appear later in development with the natural progression of linguistic skills.

Meins (1998) examined children's attachment status at 11 or 13 months and their language abilities as measured by maternal report at 20 months. The study found that securely attached children tended to have larger vocabulary levels, with a larger proportion of nouns, and they used less set phrases in their speech compared to insecurely attached children. Set phrases are multiple-word utterances that contain words that individual children do not use separately, e.g. "stop it" (Meins 1998, p. 4). Mothers from insecurely attached dyads were more likely to report that their children made vocalisations that they could not understand, compared to mothers of securely attached children, but this finding was not related to children's vocabulary size. These findings may be related to mothers in securely attached dyads attending more to their children's speech, perhaps being more likely to attribute meaning to their children's utterances than mothers of insecurely attached children. It is difficult to determine whether attachment security aids language development directly, or whether it simply fast tracks language acquisition through mothers being more attentive and responding to their children's vocalisations or gestures, and their children being more curious and persistent in new tasks. More long-term observational data is required to answer this question.

If securely attached children do indeed acquire linguistic skills at a faster rate

through their own curiosity and persistence and their mothers' responsiveness, how does attachment quality affect acquisition of the written word? A series of studies have been conducted by Bus and van IJzendoorn on the relation between Dutch children's emergent literacy and attachment security. The findings from these studies are closely linked to the conclusions drawn from the other studies in the attachment and cognition literature. Bus and van IJzendoorn (1988a) conducted a cross-sectional study on 18-, 42-, and 66-month olds examining the concurrent relationship between attachment security and literacy tasks. Mothers and children read books and watched a film clip related to letters and words. The study found that mothers in secure dyads did not need to discipline their children as often, and their children were less distracted during the literacy tasks compared to insecurely attached dyads. Also, mothers of securely attached children made more comments relating to reading instruction (e.g. naming letters, spelling words) when reading a book to their children compared to mothers of insecurely attached children. In turn, securely attached children made more attempts at proto-reading (spelling words, naming letters), asked more questions, and made more comments about the stories compared to insecurely attached children. However, no independent literacy assessment was conducted with the children to determine if children's literacy abilities as an outcome differed as a function of the attachment relationship.

In a longitudinal study of literacy and attachment, dyads were given attachment classifications when the children were two years old (Bus and van IJzendoorn, 1988b). Later when the children were five years old, mothers

completed a questionnaire on their children's literacy. Children did not differ on their knowledge of letters and words (e.g. recognising letters, writing out own name). However, securely attached children were more likely to name letters and print letters when playing and to ask for words to be read than insecurely attached children. These findings indicate that securely attached children are displaying more interest in literacy skills, or indeed more exploratory behaviour in relation to it. These findings are limited by the literacy measure being a maternal report. Mothers of secure children may simply be more attentive and observant of what their children are doing.

Bus and van IJzendoorn (1992) also observed mothers from a low socioeconomic status group reading a book to their 3 year old children. Two groups of dyads were observed: frequent book readers (who read books daily) and infrequent book readers (who read twice a week) who were matched for socioeconomic status, age, and gender. The children were assigned attachment classifications using a procedure designed for older children, which involves separating children from their mothers for half an hour and then observing the reunion behaviour (Main et al., 1985). The study found that there were fewer occasions when mothers of securely attached children had to get their children to attend to the story compared to mothers of insecurely attached children. The frequently reading group were also more securely attached than the infrequently reading group. Are these findings due to children becoming more securely attached as a result of frequent contact with their attachment figure that is "trouble free"? Or

does attachment security create a positive atmosphere which is rewarding to mother and child and therefore leads to greater participation in tasks such as reading? As mentioned previously, the problem-solving studies showed that interactions within dyads differed as a function of the attachment relationship (e.g. Matas et al., 1978). Specifically securely attached dyads had more harmonious interactions in comparison with insecurely-attached dyads, which one would expect to lead to increased performance on a task. The results from Bus and van IJzendoorn (1992) are not a function of socioeconomic status as both reading groups were from low socioeconomic status families and attachment security still differentiated them. These attachment differences however, may also appear in a high socioeconomic status group of frequent and infrequent readers. Attachment security may act as a protective factor only in high risk groups as in Morisset et al. (1990). All of these emergent literacy studies were conducted with Dutch dyads which may limit generalisability to other cultures, and the studies were also carried out in laboratories, which may limit the generalisability of these findings to natural settings.

#### Attachment Relationship and Children's Cognitive Abilities

The overarching questions from this area of research are does attachment lead to cognitive advances or simply to more motivation, and more harmonious teaching interactions? It seems as though mothers of securely-attached children are able to demand more of their children in cognitive domains because of the trust

and support that has already been established in the relationship and the positive atmosphere that accompanies these mother-child interactions. In turn, securely attached children, confident in the availability of their attachment figure, are able to explore the task to a greater extent. Over time these children may display better cognitive abilities. However, other variables may act as protective factors that obscure a secure-insecure distinction with regard to performance on cognitive tasks. For example, insecurely-attached children who are from high socioeconomic status families, well-educated families and/or who have good schooling may do as well as securely attached children. Therefore it may only be in high risk populations that a secure-insecure difference is observed on cognitive performance.

This literature review of the attachment cognition studies highlights several limitations with regard to this research. In particular, maternal reports of children's cognitive abilities were relied on (e.g. Bus & van IJzendoorn, 1988a) and many studies did not measure task performance (e.g. Matas et al., 1978). However, the research reports similar findings for attachment classifications based on the maternal Q-sort and the Strange Situation procedure.

#### Attachment Relationship and Children's Memory Abilities

Finally, a few studies have examined the relation between attachment quality and children's memory abilities. Belsky, Spritz, and Crnic (1996) studied three year old males' recognition memory for positive and negative events that were seen

previously in a puppet show and their prior attachment status with their mothers two years earlier. The findings showed that securely attached children recalled the positive events more accurately, while the converse was true for the insecurely attached children who appeared to have better recognition of the negative events.

In the only published study to date to examine attachment status and conversations about the past, Farrar, Fasig, and Welch-Ross (1997) found that children's attachment security with their mothers at age four was concurrently related to the emotional content of mother-child conversations about the past. In particular, insecure mother-daughter dyads talked more about negative emotions compared to securely attached mother-daughter dyads. Secure dyads were more likely to discuss negative emotional topics at greater length once they were initiated compared to insecurely attached mother-daughter dyads.

Of interest is how attachment status relates to the manner in which mothers and children structure memory conversations over time. Autobiographical memories are about personally experienced significant events, that involve significant others, e.g. the Attachment Figure. These memories and the way in which they are discussed may reflect differences in the internal working model of the attachment relationship of individuals. The internal working model can be compared to an event script where the child and mother both develop generalised models of how they expect each other to behave in different situations. Will the present thesis then see the internal working models of the dyad activated in a later discussion of the past event? Specifically will the current study observe differences

in the manner in which dyads of different attachment securities structure a past event conversation?



## Chapter Six

### A Tale of Autobiographical Memory Development: New Zealand Style

*“What is the use of a book, thought Alice, without  
pictures or conversations?”*

Lewis Carroll (1896, p. 13)

There were three goals of this research. The primary goal was to explore relations over time between maternal reminiscing style and children's own developing memory style, both with and independently of their mothers, from when the children were 19 months old. Past research has not clarified the role of children's early participation in memory conversations with mothers or independently in accounting for mother-to-child links to children's later independent memory. The present study predicts that children's early participation in the conversations, as measured by engaging in appropriate attentive turns even when not providing new information, would shape mothers' levels of elaboration to some degree. Past research has only examined longitudinal relations between maternal reminiscing style and children's actual provision of memory information. Equally important, especially at the younger ages, may be children's willingness to engage in a conversation about the past at all. The current study also examines children's

independent memory conversations longitudinally as well as concurrently with mother-child past event conversations. It is predicted that mothers' earlier style of structuring memory conversations will relate first to children's shared memory reports, and later to their independent memory reports. Such a result would demonstrate that children have internalised the style presented to them by their mothers. Only when children are consistent in their memory reports over time and across context can they be said to have developed a "style" for talking about the past.

Past research on children's memory talk has predominantly addressed the socialisation of such talk by primary caregivers. The present research, in keeping with Vygotsky's (1978) and Rogoff's (1990) perspectives, attempts to look in more depth at what children bring to conversations about the past with adults. Therefore the second goal was to determine the degree to which characteristics of the children, namely, language skills and gender were related both concurrently and longitudinally to mother-child and independent memory reports. The first prediction here was that children's verbal memory and maternal reminiscing style would be more strongly related to children's expressive rather than receptive language development. Previous research has not examined the possibility that the inconsistencies in the literature concerning relations between children's language abilities and verbal memory are due to measurement of a specific aspect of language, for example receptive rather than expressive language, or syntax as opposed to vocabulary. In accord with Hudson (1990) and Nelson and Ross (1980),

it is also predicted that there would be an unique relation between mothers' and children's memory conversations after controlling for children's language. Thus, language skill is not expected to completely explain verbal memory development. An additional goal was to confirm the role of child gender in these conversations over time, especially in conjunction with children's language development, as girls have been shown to have more advanced language abilities compared to boys (Fenson et al., 1993). It was predicted that mothers would be more elaborative with daughters than sons prior to the age that girls themselves were demonstrating richer memory reports than boys.

The third and final goal was to explore the contribution that dyadic characteristics, specifically attachment status, may have on mother-child and experimenter-child memory conversations. The hypothesis is that maternal style for discussing the past and children's willingness to participate and recall information may actually arise in part from the earlier parent-child relationship. Attachment gives an indication of maternal sensitivity. Mothers in more securely attached dyads in contrast to mothers from insecurely attached dyads are thought to scaffold tasks that expand on what their children can independently achieve on the task. This scaffolding may be achieved for past event conversations through the maternal style of structuring the experience. The present study proposes that mothers in more securely attached dyads will be more elaborative when their children show a willingness to participate in the memory conversations compared to mothers from insecurely-attached dyads. Children from securely-attached dyads

are predicted to both recall more and to be more willing to participate in past event conversations compared to insecurely attached children because of the positive learning environment associated with security of attachment.

The current study thus investigated relations over time between maternal reminiscing style and children's own developing memory style, both with and independently of their mothers, from when the children were 19 months old. Second the present research examined the relations between attachment quality and maternal and child conversational variables. This examination of children's autobiographical memory development is both from a younger age and with a larger sample size than any previous research. At 19, 25, 32, and 40 months, children participated in conversations with mothers about unique past events. At 25, 32, and 40 months, children talked with experimenters about unique past events. Children's language skill was assessed at each age. Attachment status was assessed when children were 19 months old.

## Chapter Seven

### Method

#### Participants

Sixty-five New Zealand mothers and their children initially participated in this study. Mothers and their children were recruited from public birth records and advertisements. The dyads were first visited when the children were all within two weeks of their 19-month birth date ( $\underline{M}$  = 19.2 months;  $\underline{SD}$  = 11.3 days). Further timepoints occurred when the children were 25 months ( $\underline{M}$  = 25.3 months;  $\underline{SD}$  = 12.2 days), 32 months ( $\underline{M}$  = 32.1 months;  $\underline{SD}$  = 9.3 days), and 40 months old ( $\underline{M}$  = 40.2 months;  $\underline{SD}$  = 18.1 days). Seven dyads were excluded from the analyses because they did not complete the study. Five of these families moved to another city, and two elected not to continue the study. The sample for this study thus consisted of 58 mother-child pairs. There were 30 males and 28 females in the sample. Twenty-three children were firstborn. Mothers all identified themselves as the children's primary caregiver. Fifty-two families were of European descent, five children had one or both parents who were New Zealand Maori, and one child had one parent who was of Asian descent. English was the primary language spoken in all the homes. The dyads were on average of middle socioeconomic status<sup>1</sup>.

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<sup>1</sup> Socioeconomic status was based on the fathers' occupation. The fathers' occupations were assigned levels from 1 to 7, where 1 was the highest socioeconomic status group (Elley, & Irving, 1976). In this sample, the average level of fathers' occupation was a level 3 (e.g. farmer, foreman, sales representative), with a range of 1 to 7.

Average maternal education was 13 years, ranging from two years at secondary school through to five years in tertiary education.

### Procedure

At each of four timepoints, mothers and children were visited in their homes by two of six female graduate student researchers for three separate sessions, typically within a two-week time period. One researcher was the primary experimenter who conducted the majority of the tasks with the child. This experimenter was constant over the three sessions within each age but was counterbalanced across the four timepoints. The second researcher operated the video and audio equipment. At the end of each timepoint the children were given a small gift (e.g. crayons) for their participation.

### Memory Conversations

At each timepoint mothers were asked to discuss several past events with their children. We told mothers that we were interested in the information that young children recall about events that they have experienced in the past. Mothers were asked to choose past events that were one-time occurrences that children had not reexperienced and that mothers had experienced with them. Mothers were asked to avoid talking about routine events (e.g. birthday parties), events that extended over a day (e.g. holidays), and events that already have a story line (e.g. movies and plays). Examples of events discussed include visiting hot pools, watching a rugby game, and feeding a lamb. At the 19-month timepoint mothers

were asked to discuss two events, while at the 25-, 32-, and 40-month timepoints mothers were asked to discuss three events. The event selection was conducted out of hearing range of the child. Following the event selection, the mothers were requested to discuss these events with her child in whatever manner she felt comfortable. No time restriction was placed on the length of the conversation. The conversations were videotaped and audiotaped with a radio microphone.

During a different session from the mother-child memory conversations, one of three female researchers discussed past events with the child. The experimenter-child memory conversations were only conducted at 25, 32, and 40 months, because piloting showed that children were unlikely to converse with experimenters at all at 19 months. The children were asked to discuss two past events at 25 and 32 months, and three past events at 40 months. Again out of the hearing range of the child, the mother was asked to select past events according to the criterion above. At 25 and 32 months only, the researcher also requested four cues from each event that would prompt the child. Cued recall was conducted to enhance the children's ability to report independent information at these young ages. Following event selection, the child was asked to come and have a conversation with the researcher. The child was allowed to sit wherever he or she felt comfortable. The researcher first asked the child for free recall about the event, e.g. "Your Mum told me that you went to the beach, but she didn't tell me what happened. Can you tell me all you remember about the beach?" When the child was no longer responding to the researcher's general prompts, the researcher

moved into the cued recall phase. During this phase the researcher asked the child about each of the four cues, e.g. "Your Mum told me that when you went to the beach you had something to eat, can you tell me about that?". At all times the researcher only replied to the child's comments with minimal encouraging responses (e.g. "yeah?, tell me more, wow, what else?"). The order of experimenter-child conversations and mother-child conversations was counterbalanced across all participants at each timepoint.

For both mother-elicited conversations and experimenter-elicited conversations, information about each event was gathered at the end of the discussions. This information included the date of the event, the number of times the child had discussed the event, and the last time that the child had talked about the event.

### Children's Language

Children's language was measured at 19- and 25-months with the MacArthur Communicative Development Inventory for Words and Sentences (CDI) (Fenson et al., 1993). The CDI measures vocabulary production and grammatical development. The CDI was completed by mothers between session 1 and session 2. The CDI was adapted for use with a New Zealand sample (Reese & Read, in press). This involved changing 41 words (6%), that are not widely used in New Zealand English, (e.g., stroller was changed to pushchair). Children's total vocabulary was used as the final score. The CDI is a highly reliable and valid language development measure.



At 32 months and 40 months, children's language was measured with alternate forms of the Peabody Picture Vocabulary Test III (PPVT-III) (Dunn & Dunn, 1997) and also the Expressive Vocabulary Test (EVT) (Williams, 1997). The PPVT-III is an individually administered untimed test. The PPVT-III measures the vocabulary comprehension of individuals and therefore one aspect of the person's vocabulary acquisition. The child is required to select the picture that best represents the word said by the examiner. The reliability and validity of the PPVT-III is well documented as being satisfactory. Four words (1.9%) in the PPVT-III, Form A at the 32-month timepoint were changed for alternative words with the same meaning because these words are not widely used in New Zealand English. The EVT is an individually administered untimed test. The EVT is a measure of expressive vocabulary. The first 38 items are labelling items. The individual is asked to label the picture or body part that the examiner points to. The remainder of the test consists of synonym items. The examiner presents a picture and asks for another word that means the same thing. The EVT is a highly reliable and valid measure of expressive vocabulary.

The EVT and the PPVT-III were administered during the second and third sessions, respectively, at the 32-month timepoint. This order was reversed at the 40-month timepoint. These tests were administered in the standard manner for 2-1/2 and 3-1/2 year old children. Standard scores were used as the final score.

#### Attachment Security

During the final session at the 19 month timepoint mothers were asked to

complete the Attachment Q-set (version 3) (Waters, 1987). The week before, mothers were given 90 statements of descriptions of children's behaviour. Mothers were asked to think about how characteristic these behaviours were of their children over the week (see Appendix A for Q-set descriptions).

During the final session, mothers were asked to sort these cards into nine piles of ten cards each, ranging from least like their child to most like their child. A trained experimenter was present during the task to answer any questions the mother might have about the activity. Mothers took an average of 35 minutes to complete the Attachment Q-set.

The Attachment Q-Set for each participant was compared to a criterion sort that reflects a hypothetical secure child. Each participant received a score that denotes how securely attached they are compared to the criterion sort. A computer programme was used to score the Q-set (Waters, 1987).

### Coding

#### Mother-Child Memory Conversations

The mother-child conversations were transcribed verbatim from audiotape at each of the four timepoints. Children's behaviours were transcribed from the videotapes. All references to the child's gender were removed from the transcripts to enable coders to be blind to the children's gender. Then the beginning and the end of the discussions about each event in the conversation were marked. The conversations were then coded according to the structural coding scheme adapted

from Reese et al. (1993) and Haden (1998). The transcripts were parsed into clauses to form the coding units. The use of the video was particularly important for coding the 19-month transcripts as it enabled us to code the children's utterances more accurately by examining the context. For example, a 19-month-old child may say "mmm" while actively attending to her mother's conversation. Alternatively, a child may say "mmm" while presenting her mother with a toy that is irrelevant to the conversational topic. Clearly these two utterances, although exactly the same in structure, have completely different functions. In the first example, the child's utterance functions as a placeholder, where the child is taking a turn within the conversation and indicating interest in continuing although providing no content. Meanwhile, in the second example, the child's utterance is off topic, perhaps indicating that the child is uninterested in the present conversation topic.

### Maternal Memory Conversation Codes

#### 1. Elaborations (ELAB)

Mothers' comments which introduce new information to the discussion, either a new event or a new aspect of the event, or give additional information about a particular aspect of the event.

##### a. Memory Questions Elaborations (MQ-ELAB)

Any question that asks the child to provide new memory information about the event or a particular aspect of the event (e.g., What did you give to the lambs?)

### b. Yes-No Questions Elaborations (YN-ELAB)

Any question simply requiring the child to confirm or deny a piece of information provided by the mother (e.g., Do you remember when we went to the rugby?). Tag questions are included as yes-no questions (e.g., And they had doggies at the circus didn't they?)

### c. Statements Elaborations (ST-ELAB)

A statement that provides the child with information about the event under discussion but does not require a response (e.g., Sue fed the baby lamb.)

## 2. Repetitions (REPS)

Mothers request the exact same content or the gist (non-verbatim) of a previous utterance, regardless of whether the previous utterance was a statement or a question

### a. Memory Questions Repetitions (MQ-REP)

Mothers request the same information from the child as in a previous utterance (e.g., Mother asks "What did you see at the zoo?" Then she asks "What did you see?")

### b. Yes-No Questions Repetitions (YN-REP)

Mother asks the child to confirm or deny the same information as in a previous utterance (e.g., Mother says "We went and saw the mud pools." Then she asks "Do you remember seeing the mud pools?"). Any tag questions that repeat a previous utterance are also included.

### c. Statement Repetitions (ST-REP)

Mothers make a statement which repeats the exact content or gist (non-verbatim) of their previous utterance(e.g., Mother asks "Can you remember playing in the snow?" Later she says "You played in the snow." ).

Maternal repetitions were then collapsed into one code based on prior research (Reese et al., 1993; Haden, 1998) and statistical reasons (the percentage of the individual repetition codes ranged from 4.2% to 9.7% of the total maternal utterances).

### 3. Confirmations (CONF)

Utterances that confirm a child's previous utterance, and often include repetition of the child's previous utterances (e.g., M: What did we feed the fish with? C: Ah some bread. M: Bread, that's right.).

## Child Memory Conversation Codes

### 1. Memory Elaborations (ME)

Children either move the conversation to a new aspect of the event, or provide new information about the event being discussed (e.g., M: What did the mother monkeys have? C: Babies).

### 2. Memory Repetitions (MR)

Children participate in the memory conversation by repeating their own or

their mother's previous utterances regarding the event without adding any new information (e.g., C: At my kindy, M: Good, C: (Child's name)'s kindy).

### 3. Memory Placeholders (PL).

Children take a conversational turn while attending to mother but provide no memory information (e.g., C: Mmm, C: I don't know).

### 4. Off-topic Talk (OFF)

Within a conversation about an event, children talk about topics which are not related to the event under discussion.

Other codes were used for both mothers and children but these codes each comprised less than 5% of total talk and so were excluded from further consideration. These codes included maternal negations when a mother negates what the child has said; maternal remember prompts that request that the child says more but do not contain any content; maternal placeholders when the mother takes a turn in the conversation that also does not contain any content; maternal fill-in-the-blank statements that allow the child to complete the sentence; children's memory questions about the event; children's evaluative utterances that confirm or negate a mother's previous utterance; mothers' and children's metamemory statements that refer to the process of remembering; mothers' and children's talk that was tangentially associated with the event under discussion in the form of general

knowledge talk, future talk about the event, talk about a similar past event or fantasy talk about the event, and mothers' and children's clarification questions, where either conversational partner asked for clarification of the other's previous utterance. In addition, unintelligible talk (14.1%) and maternal off-topic talk (6.5%) were excluded from the analyses.

Two raters who were unaware of the gender and attachment classifications of the children independently coded 25% of the transcripts at each timepoint for reliability. Reliability estimates (kappa) by partner and time ranged from .83 to .86. The remaining transcripts were coded by one of the coders.

#### Experimenter-Child Memory Conversations

The audiotapes were transcribed verbatim. The beginning and the end of each event was marked. The transcripts were parsed by clause for children's utterances and experimenter prompts (both general and cued prompts) to form the coding units.

The children's utterances were coded according to the coding scheme used for the children's utterances in the mother-child memory conversations. In these conversations, the variable of interest was children's independent report of unique information to use as an outcome measure of children's memory abilities. Two raters independently coded 25% of the transcripts at each age for reliability. Kappas ranged from .84 to .91.

The variable of interest in the experimenter-child conversations was how

much unique memory information the children reported once the number of experimenter prompts were controlled for. Due to the naturalistic character of the interviews, children received different numbers of prompts from the experimenter. Therefore, to control for this difference, total memory elaborations per event were divided by the total experimenter prompts per event, to give an index of unique memory information reported by the child.

The results from the current research are presented in two separate chapters to aid clarity, each of which is followed by a discussion. The first section pertains solely to the memory conversations over time. The second section examines the contribution of the attachment relationship to the memory conversations.



## Chapter 8

### **Results I: Joint Mother-Child Reminiscing and Children's Independent Memory Talk**

#### Event Characteristics

Different numbers of events were discussed at each timepoint, so mean frequencies per event for each code for each participant were calculated. In total, mothers discussed 627 shared events with their children over the four timepoints. Only 5 events were unshared events and therefore uncodable. Because past research has been conducted on events that were primarily positive (e.g. Reese & Brown, in press), two coders coded the past events for whether they were primarily positive or negative experiences. The average percent agreement reliability on 25% of the transcripts for emotional tone of the mother-child events was 96.4%. The events selected for the mother-child conversations were primarily emotionally positive experiences, with 89.4% of the events being positive in tone. The average length of time between the actual experience of the event and the discussion between mothers and children was 51.1 days (range = 1-365 days). In total, children discussed 400 past events with the experimenter during the last three timepoints. Again the events were primarily positive experiences (90.5%), with the average percent agreement reliability on 25% of the transcripts between the two coders being 98.5%. The average time between the actual experience of the event

and the discussion of the event with the experimenter was 47.9 days (range = 1-365 days). The difference between the average times between event and discussion for mother-child and experimenter-child interviews was analysed using a paired t-test. This difference was found to be non-significant,  $t(1, 57) = .78$ , ns.

### Overview of Analyses

The current study was first interested in whether mothers initially enhanced their children's memory participation in conversations prior to bidirectional influences occurring. The first set of analyses therefore examined the relations between and within mothers' and children's conversations over the four timepoints. The role of maternal education, children's language abilities and child gender in mother-child memory conversations were also examined. Next, the current study was interested in whether children internalised their mothers' style of past event discussion and exhibited it in their independent memory reports through increased memory elaborations at this young age. Thus, the next set of analyses focused on the relations between mothers' and children's conversational style and children's independent memory. Additional analyses involving children's language abilities and child gender were also conducted on the experimenter-child conversations.

Six mother-child past event conversations and two experimenter-child conversations were not recorded, due to tape- and video-recorder malfunction. The data for these dyads were substituted with group means for each code at that timepoint. Two mothers did not return the CDI, one at the 19-month timepoint and

the other at the 25-month timepoint. Four children did not complete the PPVT at 32 months, and three children did not complete the PPVT at 40 months. One child did not complete the EVT at 32 months, and three children did not complete it at 40 months. Mean substitution was used for all of these missing language scores.

Examination of the data showed that some conversational variables and the 19-month language variable were positively skewed. The EVT language variable at 32 months was negatively skewed. Logarithmic, square root, and inverse transformations were performed as needed to adjust for skewness. Transformed variables were used in all correlational analyses (Tabachnick & Fidell, 1996).

#### Change Over Time in Mother-Child Conversations

First mothers' change over time in their use of different types of elaborations, repetitions, and confirmations was examined. Repeated-measures ANOVAs with children's gender as a between-subjects factor were performed to assess change in each type of maternal elaboration, maternal repetitions, and maternal confirmations over time (see Table 8.1 for untransformed means). These analyses revealed that all maternal utterances changed significantly over time, with no main effect or interaction with gender. Maternal memory question elaborations increased from the 19-month timepoint through to the 40-month timepoint,  $F(3, 168) = 32.78, p < .01$ . Maternal confirmations also increased over time,  $F(3, 168) = 13.32, p < .01$ . Mothers' use of yes-no question elaborations and statement elaborations decreased over time, ( $F(3, 168) = 3.63, p < .05$  and  $F(3, 168) = 10.29, p < .01$ , respectively).

Maternal repetitions also decreased significantly over time,  $F(3, 168) = 7.17, p < .01$ .

The change in children's memory responses and placeholders over time was also analysed using repeated-measures ANOVAs with children's gender as a between-subjects factor (see Table 8.1 for untransformed means). Children's memory elaborations significantly increased from 19- to 40- months,  $F(3, 168) = 57.54, p < .01$ . There was a significant interaction between children's memory elaborations and children's gender over time,  $F(3, 168) = 4.89, p < .01$ . At 25 months, girls reported significantly more memory elaborations ( $M = 2.80$ ) compared to boys ( $M = 1.52$ ),  $t = 2.38, p < .05$ . Children's placeholders increased significantly from 19 to 40 months,  $F(3, 168) = 6.13, p < .01$ , with no main effect or interaction with gender. Children's memory repetitions, however, did not change significantly over time. Finally, children's off-topic talk significantly decreased over time,  $F(3, 168) = 4.35, p < .05$ , with no main effect or interaction with gender.

**Table 8.1**

Mean Frequencies per Event (and sd) of Contributions to Mother-Child Conversations

Mother-child conversational variables	Timepoints			
	19 months	25 months	32 months	40 months
MQ-ELAB	1.96 (1.70)	3.69 (2.18)	4.90 (2.26)	4.30 (2.36)
YN-ELAB	5.50 (3.53)	4.86 (2.48)	4.87 (2.11)	4.06 (2.34)
ST-ELAB	4.95 (4.31)	3.11 (3.01)	2.85 (2.73)	2.80 (2.86)
CONF	1.60 (3.44)	2.82 (2.42)	4.18 (2.94)	4.12 (2.63)
REPS	7.30 (7.00)	7.05 (4.64)	7.11 (3.97)	4.29 (2.29)
ME	0.35 (.78)	2.15 (2.10)	3.55 (2.65)	4.46 (2.84)
MR	1.62 (3.20)	1.74 (1.61)	1.46 (1.30)	1.30 (1.09)
PL	1.31 (1.79)	1.76 (2.19)	2.71 (3.06)	2.39 (2.14)
OFF	1.74 (2.06)	1.90 (1.63)	2.45 (2.19)	1.35 (1.33)

### Data Reduction

Children's gender will not be considered in subsequent analyses because there was only one significant effect involving gender. Next, Pearson correlations were conducted between years of maternal education and the mother-child conversation variables to examine whether mothers' level of education attainment was related to the past event conversations. Mothers' level of education was only related to mothers' use of statement elaborations at 25 months,  $r = .32$ ,  $p < .01$ . As maternal education does not appear to play an important role in the past event

conversations between mothers and children it will not be considered further in subsequent analyses. The current study was primarily interested in long-term relations within the mother-child conversations. Conversational variables were selected for further analysis on statistical grounds. Conversational variables that demonstrated the strongest long-term correlations between mother and child were selected. Pearson correlational analyses were first conducted between the five maternal conversational variables and the four child conversational variables across all four timepoints in order to examine the long-term relations for the child variables (see Appendix B for correlations not presented elsewhere in this chapter). In summary, of the 60 possible long-term correlations, the percentages of significant relations were: children's off-topic talk (8.3%), children's memory repetitions (11.7%), children's placeholders (23.3%), and children's memory elaborations (33.3%). Previously, children's memory repetitions and placeholders have been collapsed into one code purported to measure participation in memory conversations (Reese, et al., 1993; Welch-Ross, 1997). Preliminary analyses demonstrated that at these younger ages, memory repetitions and placeholders appear to be measuring different aspects of children's memory conversations. The long-term relations between memory repetitions and maternal conversation variables are not as strong as for children's placeholders; therefore memory repetitions are not included in further analyses. Similarly, children's off-topic talk is also not considered in further analyses as there were few long-term relations. Children's memory elaborations and children's placeholders demonstrated strong

long-term relations with maternal conversational variables and therefore will be considered further in the analyses.

Next the long-term relations between the five maternal variables and the two chosen child variables, children's memory elaborations and placeholders, were examined across the four timepoints. Twenty-four correlations were examined for each maternal variable. The percentages of significant long-term relations were: maternal repetitions (12.5%), maternal elaborations (range = 20.8 - 45.8%), and maternal confirmations (41.7%). Maternal repetitions were dropped from subsequent analyses as a result of these preliminary analyses and on conceptual grounds (Reese et al., 1993).

Analyses are therefore based on maternal elaborations and confirmations, and children's memory elaborations and placeholders. Memory elaborations are an indication of children's skill in talking about the past. Placeholders are a useful indication of children's participation in memory conversations, especially at the younger ages when children are near floor levels for memory elaborations. Past research did not address the possibility that maternal reminiscing style, although not a function of children's early memory elaborations, could be partially in response to children's placeholders.

#### Relations Between Mothers' and Children's Memory Conversations Concurrently and Over Time

Next the relationships in the conversations between mothers and children over

the four ages were assessed. To date, this literature has not examined mother-child conversations about the past from this young an age, with the exception of case studies that focused primarily on the children's contributions over time (e.g. Sachs, 1983; Hudson, 1990).

Pearson correlational analyses were conducted on the four maternal conversational variables and the children's two conversational variables at each timepoint. First, the consistency of each maternal variable and child variable across time was analysed. Tables 8.2 and 8.3 show the zero-order correlations for each child variable and each maternal variable over time. Children's memory elaborations and children's placeholders did not become stable until 25 months. Early maternal elaborations predicted later maternal elaborations. Maternal confirmations, however, did not become stable until the 25-month timepoint.

**Table 8.2**

Longitudinal Correlations Within Each Child Conversational Variable

	ME19	ME25	ME32
ME25	.14		
ME32	.29*	.52**	
ME40	.24	.27*	.44**
	PL19	PL25	PL32
PL25	.19		
PL32	.11	.47**	
PL40	.12	.35**	.46**

\*  $p < .05$  \*\*  $p < .01$ .



**Table 8.3**Longitudinal Correlations Within Each Maternal Conversational Variable

	MQ-ELAB19	MQ-ELAB25	MQ-ELAB32
MQ-ELAB25	.39**		
MQ-ELAB32	.43**	.59**	
MQ-ELAB40	.10	.32*	.39**
	YN-ELAB19	YN-ELAB25	YN-ELAB32
YN-ELAB25	.22		
YN-ELAB32	.40**	.31*	
YN-ELAB40	.32*	.46**	.40**
	ST-ELAB19	ST-ELAB25	ST-ELAB32
ST-ELAB25	.41**		
ST-ELAB32	.48**	.38**	
ST-ELAB40	.34**	.31*	.47**
	CONF19	CONF25	CONF32
CONF25	.09		
CONF32	.22	.28*	
CONF40	.00	.13	.38**

\*  $p < .05$  \*\*  $p < .01$ .

Second, the concurrent relations between mother and child conversational variables were analysed (see the diagonals; Table 8.4). Most maternal and child conversational variables were concurrently related at each timepoint. One notable exception was that maternal statement elaborations were largely not concurrently related to children's memory elaborations.

The final step was to analyse the relations between maternal and child variables over time. Cross-lagged Pearson correlational analyses were conducted on the mother-child conversations across the four timepoints to discover what aspects of mothers' conversation and children's conversation predicted each other longitudinally (see Table 8.4). Long-term child-to-mother relations are depicted below the diagonals; long-term mother-to-child relations are depicted above the diagonals. On examination of Table 8.4, it is apparent that memory question elaborations and confirmations showed the strongest long-term relations with children's memory elaborations and placeholders. Therefore, maternal memory question elaborations and confirmations were investigated in more detail with reference to children's memory elaborations and placeholders.

**Table 8.4**

Concurrent and Cross-Lag Correlations Between Maternal and Child Conversational Variables

Maternal Variables	Child Variables							
	ME19	ME25	ME32	ME40	PL19	PL25	PL32	PL40
MQ-ELAB19	<b>.40**</b>	.31*	<b>.40**</b>	.16	<b>.45**</b>	.15	.23	.25
MQ-ELAB25	.15	<b>.72**</b>	<b>.51**</b>	.25	.30*	<b>.33*</b>	<b>.39**</b>	.21
MQ-ELAB32	.15	<b>.53**</b>	<b>.70**</b>	.32*	<b>.37**</b>	<b>.36**</b>	<b>.46**</b>	<b>.49**</b>
MQ-ELAB40	.00	.28*	.22	<b>.66**</b>	.13	.03	.15	<b>.34**</b>
YN-ELAB19	<b>.44**</b>	.15	.28*	.21	<b>.25</b>	.10	.24	.24
YN-ELAB25	-.06	<b>.35**</b>	.18	-.03	.21	<b>.62**</b>	.27*	.20
YN-ELAB32	.11	.32	<b>.06</b>	.26*	-.11	.26*	<b>.40**</b>	<b>.45**</b>
YN-ELAB40	-.10	.20	.25	<b>.50**</b>	.13	.23	.32*	<b>.46**</b>
ST-ELAB19	<b>.34**</b>	.18	.17	.18	<b>.25</b>	.15	.10	.13
ST-ELAB25	.19	<b>.24</b>	.10	.12	.07	<b>.35**</b>	.00	.04
ST-ELAB32	.23	<b>.38**</b>	<b>.14</b>	.28*	<b>.34**</b>	.25	<b>.36**</b>	.28*
ST-ELAB40	.09	-.01	.15	<b>.24</b>	.23	.20	.25	<b>.42**</b>
CONF19	<b>.56**</b>	.08	.29*	.18	<b>.41**</b>	.09	.09	.23
CONF25	.18	<b>.80**</b>	<b>.46**</b>	.27*	.21	<b>.40**</b>	<b>.41**</b>	.19
CONF32	.27*	.32*	<b>.77**</b>	<b>.34**</b>	<b>.39**</b>	.16	<b>.09</b>	<b>.37**</b>
CONF40	.06	.13	.31*	<b>.79**</b>	.21	.00	.24	<b>.40**</b>

\*p < .05. \*\* p < .01.

It is also important to know to what degree these relations between maternal conversational variables and children's conversation are governed by children's language facility. First, Table 8.5 shows the mean values for children's language abilities across time as a function of gender.

**Table 8.5**

Mean Frequencies (and sd) of Children's Language Level across Time and Gender of the Child

Children's language	Children's gender	
	Girls (n = 28)	Boys (n = 30)
19-month production	144.62 (128.67)	69.67 (67.34)
25-month production	398.92 (151.63)	285.53 (177.58)
32-month production <sup>a</sup>	101.29 (11.52)	93.20 (13.28)
32-month comprehension <sup>a</sup>	99.48 (13.22)	96.39 (10.87)
40-month production <sup>a</sup>	108.67 (11.83)	99.60 (9.88)
40-month comprehension <sup>a</sup>	104.63 (11.60)	95.54 (13.48)

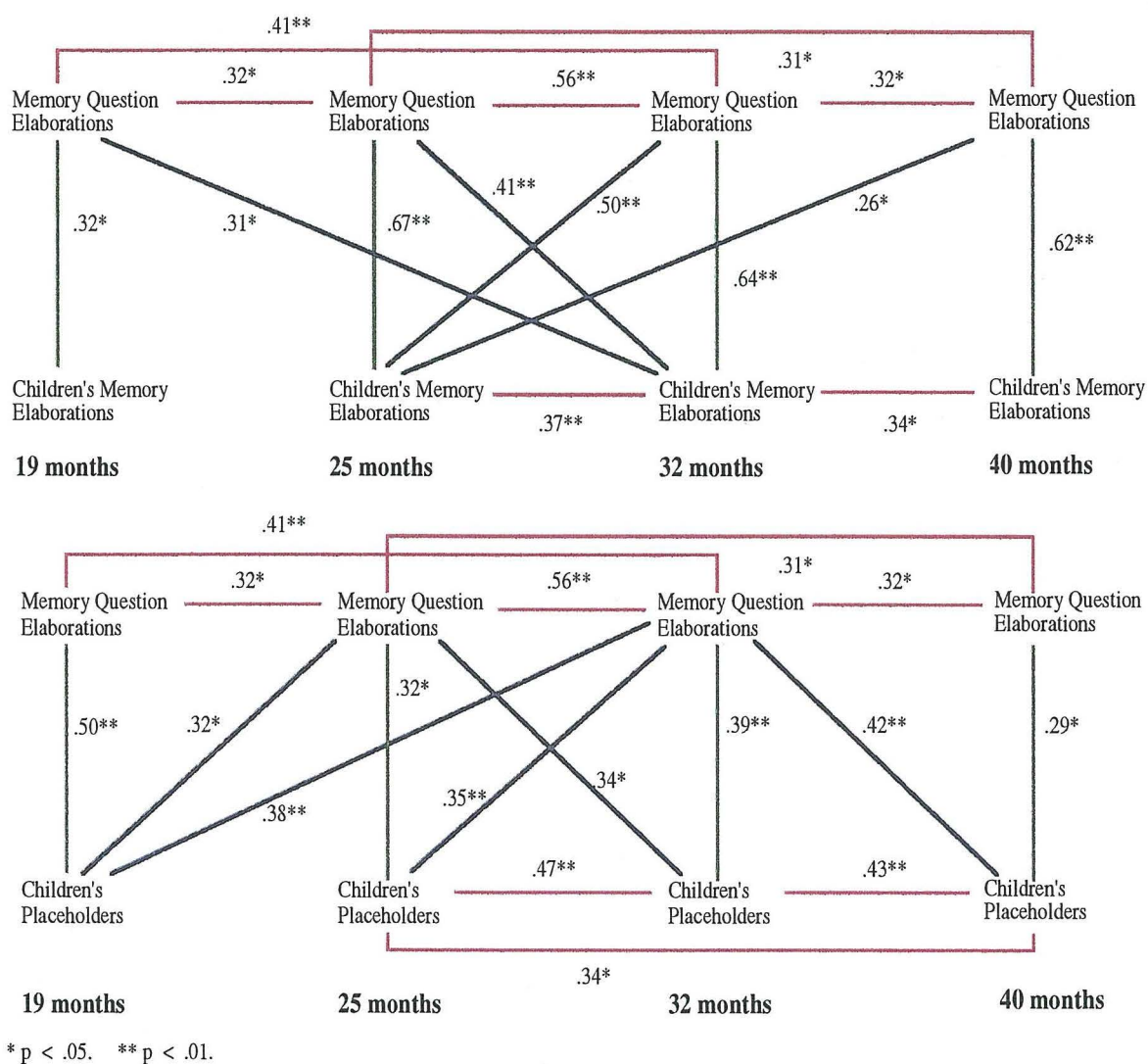
<sup>a</sup> Standard scores.

In the current sample, children's language varied by gender (see Table 8.5 for untransformed means by gender). One-way ANOVAs revealed that girls'

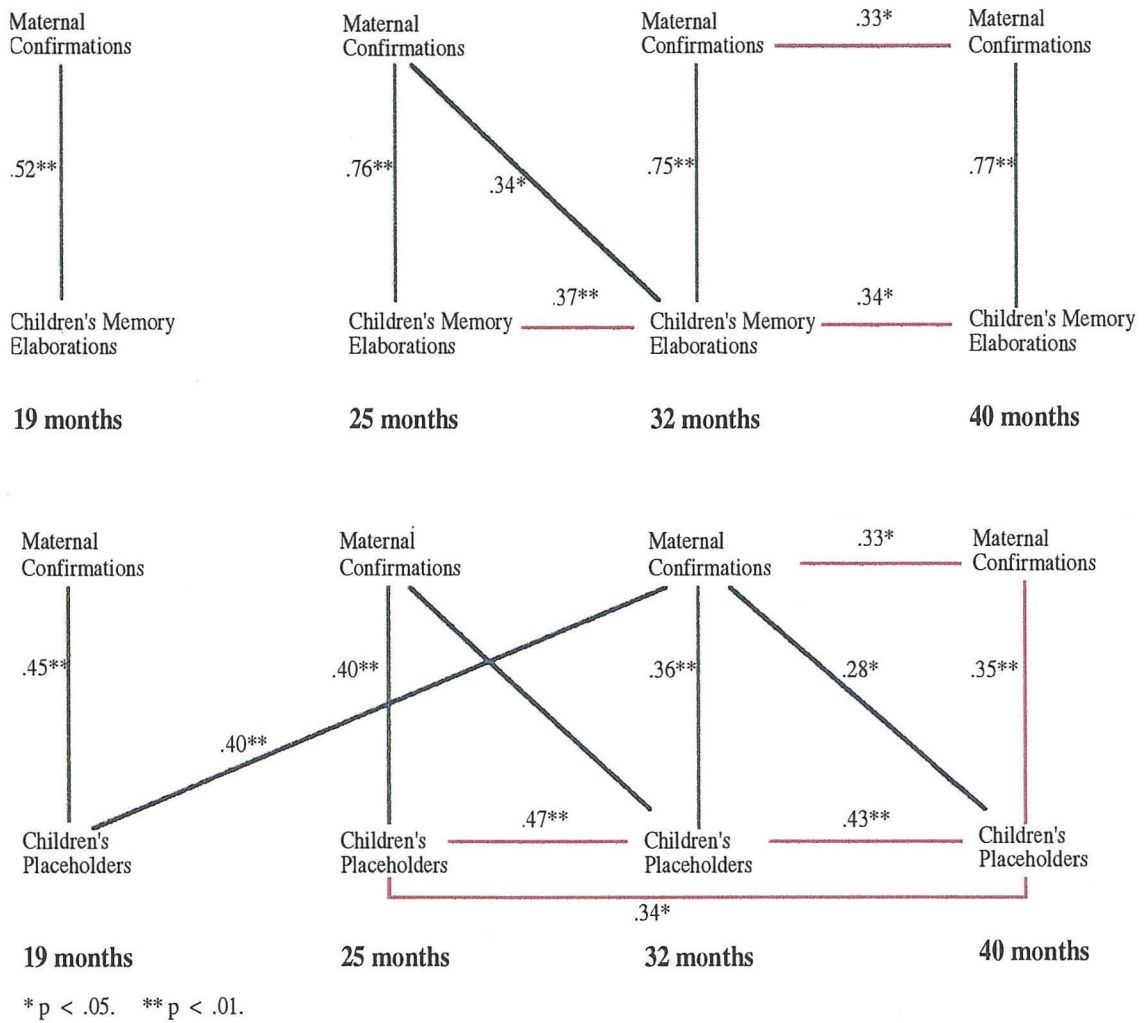
productive language was higher than boys' at all time points (all  $p$ s < .05). Girls and boys did not differ on their receptive language at 32 months, however at 40-months girls had significantly higher receptive language scores than boys,  $F(1, 57) = 7.53$ ,  $p < .01$ . This gender difference in language skill apparently did not contribute to gender differences in verbal memory, because as previously mentioned only one gender difference was observed in the preliminary verbal memory analyses.

Second, Pearson correlational analyses were conducted between children's language ability and mother-child conversational variables. Seventeen of the 24 mother-child conversational variables were significantly correlated with children's concurrent language at  $p < .05$  (range = .08 to .47). Both children's expressive (six out of eight correlations) and receptive language abilities (five out of eight correlations) were significantly correlated with mother-child conversational variables at the later timepoints. Thus, partial correlation analyses that controlled for children's language skills were conducted on relations between mothers' memory question elaborations and confirmations, and children's memory elaborations and placeholders over time. For instance, children's 19-month language was partialled out of all 19-month concurrent and longitudinal correlations, children's 25-month language was partialled out of all 25-month concurrent and longitudinal correlations, and so on. Figure 8.1 illustrates the significant relations between mothers' memory question elaborations and children's contributions over the study once children's language is controlled. Figure 8.2 illustrates the significant relations between maternal confirmations and children's contributions

over the study once children's language is controlled.



**Figure 8.1.** Cross-lagged partial correlations between maternal memory question elaborations and children's memory elaborations and placeholders.



**Figure 8.2.** Cross-lagged partial correlations between maternal confirmations and children's memory elaborations and placeholders.

How are children and mothers predicting each others' memory conversations over time? Mothers' memory question elaborations at the 19-month timepoint predicted children's subsequent memory elaborations (see Figure 8.1). Children also initially predicted their mothers' later use of questions through their

placeholders. However, children's placeholders were not consistent until 25 months which does not strongly support child effects on maternal use of memory question elaborations. The finding that children's memory elaborations did not become stable until 25 months lends support to the idea that maternal memory question elaborations initially predict children's memory elaborations. Bidirectional relations existed between maternal memory question elaborations and children's responding from 25 to 32 months. For instance, children's memory elaborations and placeholders at 25 months predicted mothers' later memory question elaborations at the 32-month timepoint, and maternal memory question elaborations at the 25-month timepoint predicted children's later memory elaborations and placeholders at 32 months. Further bidirectional relations were apparent in predicting the 40-month variables. Children's memory elaborations at 25 months predicted mothers' use of memory question elaborations at 40 months. From the 32- to 40-month timepoint, the only long-term pattern was mother to child directionality for children's placeholders. In predicting children's memory elaborations, then, mother to child directionality appeared to precede bidirectionality.

Maternal confirmations were concurrently related to children's memory elaborations at each timepoint (see Figure 8.2). The only long-term relation between maternal confirmations and children's memory elaborations was between 25 and 32 months. Maternal confirmations were also concurrently related to children's placeholders at all timepoints. Children's placeholders in the 19-month conversations were related to maternal confirmations at the 32-month timepoint.



Maternal confirmations at the 25- and 32-month timepoints were related to children's later use of placeholders at 32 and 40 months.

In summary, mothers' use of memory question elaborations was consistent over time, and showed both concurrent and long-term relations with children's contributions to the conversations about the past, irrespective of children's language abilities. In turn, children's early placeholders appeared to contribute to mothers' later use of memory question elaborations and confirmations. The use of confirmations by mothers, however, appeared to be predominantly related to what children were saying in the immediate conversations and to children's language abilities. Many of the zero-order long-term relations between maternal confirmations and children's contributions to the conversations disappeared when children's language skills were accounted for.

#### Directionality of the Long-term Relations in Mother-Child Memory Conversations

The partial correlational analyses established maternal memory question elaborations as the key component of maternal reminiscing style and therefore as a candidate for long-term influences on children's verbal memory. The pattern of long-term correlations between maternal and child reminiscing suggested that mothers might initially shape children's memory reports, although children also seemed to play a role in shaping maternal style through their participation in the conversations. Paths to children's memory reports and maternal reminiscing style were tested more directly through mediation models (Baron & Kenny, 1986). For

each long-term correlation between mothers' earlier memory question elaborations and children's later responding, the possibility was tested that the concurrent child variable mediated children's later responding. For each long-term correlation between children's earlier responding and mothers' later memory question elaborations, the possibility was tested that the concurrent maternal variable mediated mothers' later responding. In each case, the possibility was tested that the apparently direct long-term correlations actually reflected indirect paths of influence through a concurrent variable.

To conduct tests of mediation, the following initial conditions must be present (Baron & Kenny, 1986). First, the hypothesised independent variable must significantly predict the hypothesised mediator variable. In these models, this condition was tested through the concurrent correlations between mother and child. Second, the hypothesised mediator variable must significantly predict the dependent variable. In these models, this condition was tested through the consistency correlations within variables. If these two initial conditions are met, the test for mediation involves regressing the dependent variable on both the independent and mediator variables. If the independent variable ceases to be a significant predictor, or if its prediction is substantially decreased from the univariate case, and the mediator variable still predicts the dependent variable, then a mediator model best accounts for the relation between independent and dependent variables. In these cases, the independent variable is hypothesised to affect the dependent variable indirectly, through the mediator variable.

All but one of the nine long-term correlations between maternal memory question elaborations and children's responding met the initial two conditions for testing mediation. The long-term correlation between mothers' memory question elaborations at 19 months and children's 32-month memory elaborations could not be tested for mediation because children's 19-month memory elaborations did not significantly predict their 32-month memory elaborations. The remaining eight relationships were submitted to regression analyses to test for mediation. In each regression analysis, children's earlier language skill was entered in the first step as a control variable in predicting later maternal memory question elaborations, children's memory elaborations, or placeholders. In the second step, the hypothesised mediator and independent variables were entered together. Most models tested fit with a mediation hypothesis, in that the independent variable no longer significantly accounted for variance in the dependent variable once the mediator variable was also in the equation.

Table 8.6 contains the regression results for mediation tests predicting maternal memory question elaborations. Mothers' 25-month memory question elaborations mediated the relation between children's 25-month memory elaborations and mothers' 32-month memory question elaborations. Neither mothers' 19-month memory question elaborations nor children's 19-month placeholders, however, served as clear mediators of mothers' 25-month memory question elaborations: with both independent variables in the equation, neither uniquely predicted mothers' 25-month memory question elaborations. Mothers' 19-

and 25-month memory question elaborations did serve to mediate the relation between children's 19- and 25-month placeholders and mothers' 32-month memory question elaborations. Maternal memory question elaborations and children's memory elaborations at the 25 month timepoint did not serve as clear mediators of maternal memory question elaborations at the 40 month timepoint. Neither variable uniquely predicted mothers' 40-month memory question elaborations.

**Table 8.6**

Results of Mediation Models Predicting Maternal Reminiscing

	<u>25 months</u>			<u>32 months</u>			<u>40 months</u>		
	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>
<u>Predicting MQ-ELAB</u>									
1. 25-mo. Language				-.0006	.002	-.05	.00005	.002	.004
2. 25-mo. MQ-ELAB				2.10	.74	.44**	.92	.91	.19
25-mo. ME				.81	.56	.24	.54	.69	.15
1. 19-mo. Language	.11	.05	.26 <sup>m</sup>	.009	.26	.05			
2. 19-mo. MQ-ELAB	.19	.13	.22	1.29	.62	.31*			
19-mo. PL	.16	.11	.21	.83	.50	.23			
1. 25-mo. Language				.0002	.00	.01			
2. 25-mo. MQ-ELAB				2.51	.58	.52**			
25-mo. PL				.71	.42	.19			

\*\*p < .01; \* p < .05; <sup>m</sup>p < .10.

Note. Beta weights represent entry as final term into the model.

Table 8.7 contains the regression results for mediation tests predicting children's memory elaborations and placeholders.

**Table 8.7**

Results of Mediation Models Predicting Children's Participation and Memory

	<u>25 months</u>			<u>32 months</u>			<u>40 months</u>		
	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>
<u>Predicting Children's ME</u>									
1. 25-mo. Language				.001	.00	.33**			
2. 25-mo. ME				.17	.50	.18			
25-mo. MQ-ELAB				.35	.20	.27 <sup>m</sup>			
<u>Predicting Children's PL</u>									
1. 25-mo. Language				.0005	.001	.12			
2. 25-mo. PL				.34	.20	.22 <sup>m</sup>			
25-mo. MQ-ELAB				.47	.14	.39**			
1. 32-mo. Language (EVT)						-.09	.06	-.22	
(PPVT)						-.006	.007	-.12	
2. 32-mo. PL						.24	.10	.32*	
32-mo. MQ-ELAB						.07	.03	.31*	

\*\* $p < .01$ ; \*  $p < .05$ ; <sup>m</sup> $p < .10$ .

Note. Beta weights represent entry as final term into the model.

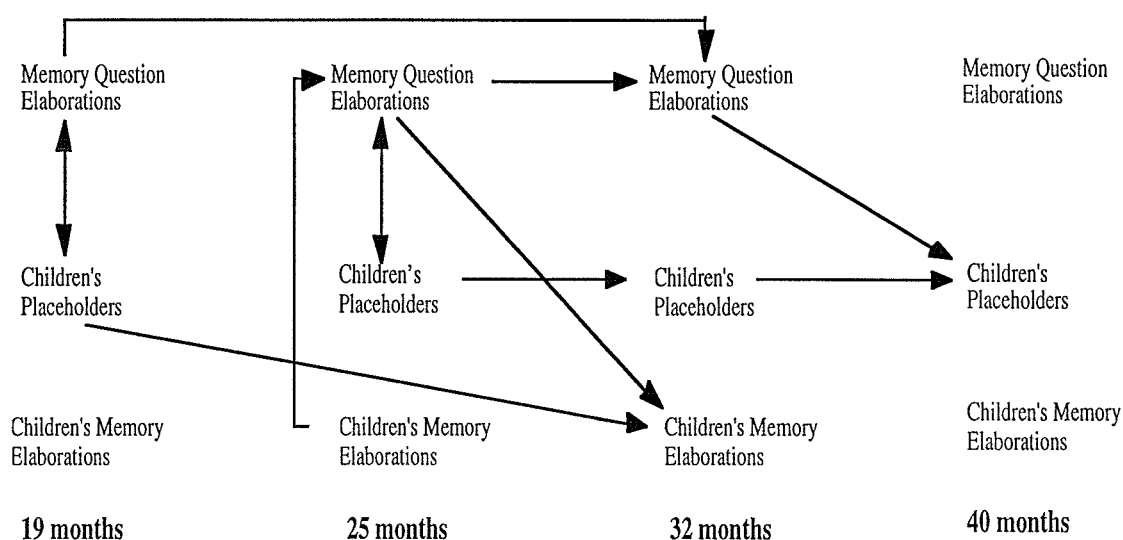
Mothers' 25-month memory question elaborations mediated the relationship between children's 25- and 32-month memory elaborations, counter to our predictions that children's earlier memory elaborations would be the mediator. In this case, children's 25-month memory elaborations decreased from a univariate beta weight of .36 to a multivariate beta weight of .18 once mothers' 25-month memory question elaborations were in the regression. Children's 25-month placeholders mediated the relation between mothers' 25-month memory question elaborations and children's 32-month placeholders. The model for predicting children's 40-month placeholders, however, did not fit with a mediation interpretation. At 32 months, both mothers' memory question elaborations and children's placeholders were unique predictors.

Recall that one long-term correlation could not be tested for mediation because of the lack of consistency between children's 19- and 32-month memory elaborations. Children's 19-month placeholders, however, correlated at  $r = .46$ ,  $p < .05$  with their 32-month memory elaborations. Thus a path from mothers' 19-month memory question elaborations, through children's 19-month placeholders, to children's 32-month memory elaborations was tested. Children's 19-month placeholders indeed mediated the relation between mothers' 19-month memory question elaborations and children's 32-month memory elaborations. After controlling for 19-month language, children's placeholders at 19 months served as a clear mediator ( $\beta = .38$ ,  $p < .01$ ) between 19-month maternal memory question elaborations and children's memory elaborations at 32 months. In contrast, the

multivariate beta weight for mothers' memory question elaborations was no longer significant ( $\beta = .11$ , ns).

Figure 8.3 summarises the resulting paths of influence. Note that in this figure, only paths verified through the mediation tests are shown; for clarity, the concurrent and consistency correlations are not represented. The reminiscing system appears to begin jointly between mothers and children. From 19 months, children's placeholders shape mothers' concurrent memory question elaborations which then mediate later memory question elaborations. Mothers' early memory question elaborations also shape children's placeholders, which then mediate children's later memory elaborations. But at 25 months, maternal memory question elaborations mediate children's later memory elaborations. Mothers are also mediating their own later memory question elaborations at this timepoint. Between 32 to 40 months, both mothers and children uniquely predict children's later placeholders. Thus, early on the child helps to "set" the mother's reminiscing style. In turn, the mother's style elicits children's participation in memory conversation in the form of placeholders. Later, though, it is maternal style that mediates children's actual memory reporting in the form of memory elaborations at 32 months. The two candidates for mediating children's shared memory elaborations at 32 months are thus children's 19-month placeholders and mothers' 25-month memory question elaborations. Critically, when these two variables are entered together in a regression analysis predicting 32-month memory elaborations, even after controlling for language and 19-month memory question elaborations, both

children's 19-month placeholders ( $\beta = .32, p < .05$ ) and mothers' 25-month memory question elaborations ( $\beta = .34, p < .01$ ) remained uniquely significant predictors of children's 32-month memory elaborations. In general, language ceased to be a significant predictor of maternal style and children's later responding (see final beta weights in Tables 8.6 and 8.7). One exception was in predicting children's memory elaborations at 32 months for which language remained a significant predictor.



**Figure 8.3.** A mediator model of mother-child memory conversations between 19 and 40 months.

### Children's Independent Memory

Repeated-measures ANOVAs with children's gender as a between-subjects factor were performed to assess change in children's independent memory over



time. These analyses revealed that children's independent memory reports significantly increased over time,  $F(2, 112) = 11.74, p < .01$ , but there was no main effect or interaction with gender (see Table 8.8 for untransformed means).

**Table 8.8**

Mean Frequency (and sd) per Experimenter Prompt of Children's Independent Memory Elaborations

	Timepoint		
	25-months	32-months	40-months
Independent memory elaborations	.08 (.12)	.19 (.30)	.34 (.52)

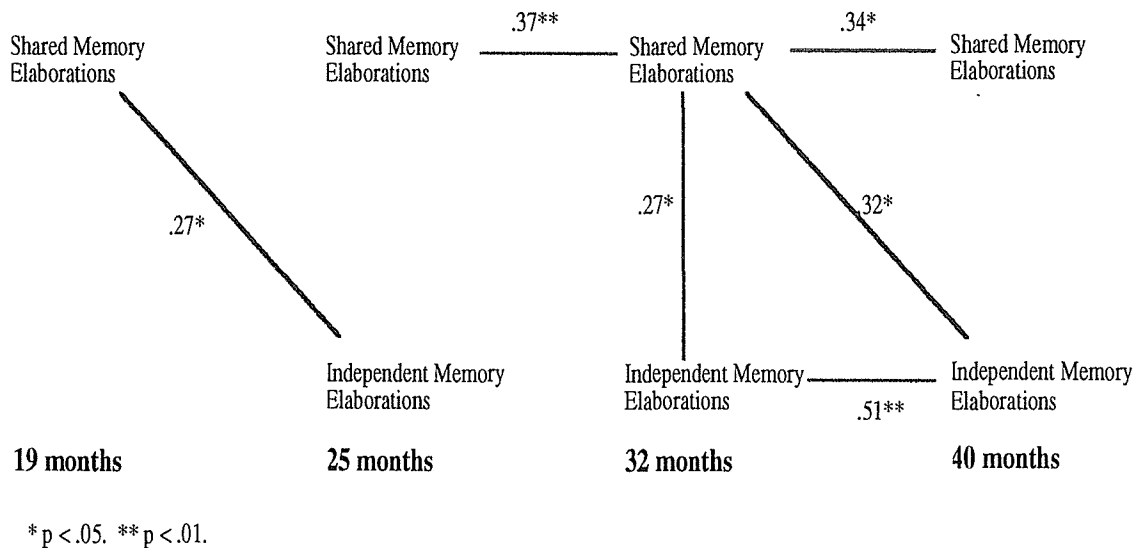
Next, Pearson correlations were conducted between children's independent memory reports at each timepoint. These analyses showed that no relation existed between how much the children were reporting independently at 25 months and how much they reported independently at 32 months,  $r = 0.16, ns$ . However, children's independent memory reports at 32 months were positively related to children's independent memory reports at 40 months,  $r = .53, p < .01$ . Also, children's independent memory reports at 25 months were positively related to children's independent memory reports at 40 months,  $r = .28, p < .05$ . Children therefore showed consistency in their independent reports of unique information

over time, especially from 32 months.

Children's independent reports of memory elaborations at 25 months were significantly correlated with their 25-month language abilities,  $r = .52$ ,  $p < .01$ . Children's 40-month independent memory elaborations were also significantly correlated with their concurrent 40-month language abilities,  $r = .36$ ,  $p < 0.01$  with the PPVT, and  $r = .33$ ,  $p < .05$  with the EVT.

### Relations Between Shared Memory Conversations and Children's Independent Memory

To investigate the possibility that children were internalising their mothers' styles of discussing the past and displaying this style in later independent memory conversations, correlational analyses were conducted between the mother-child conversational variables and children's independent memory elaborations. First, children's independent memory reports were analysed with respect to their use of memory elaborations and placeholders with their mothers, controlling for children's earlier language abilities. The only significant relation between children's placeholders with their mothers and their independent reports of unique information was a concurrent relation at 25 months,  $r = .27$ ,  $p < .05$ . Figure 8.4 illustrates the significant relations between children's shared memory elaborations and children's independent memory elaborations. Shared memory elaborations were concurrently and longitudinally correlated with children's independent memory.



**Figure 8.4.** Cross-lagged partial correlations between children's shared memory elaborations and children's independent memory elaborations.

Next, correlational analyses between maternal memory question elaborations and children's independent memory elaborations were conducted with children's language partialled out. Mothers' use of memory question elaborations at 32 months predicted children's later independent reports of unique information at 40 months,  $r = .28$ ,  $p < .05$ . We tested further the possibility that mothers' memory question elaborations or children's shared memory elaborations may mediate children's independent memory elaborations at 40 months. Children's 32-month language was entered in the first step as a control variable in predicting children's later independent memory elaborations. In the second step, mothers' memory question elaborations and children's shared memory elaborations at 32 months were entered. At 32 months, neither mothers' memory question elaborations ( $\beta =$

.14, ns) nor children's shared memory elaborations ( $\beta = .25$ , ns) uniquely predicted children's later independent memory. In short, neither of the shared memory variables served as a mediator of children's 40-month independent memory elaborations.

In summary, mothers' use of memory question elaborations at the 32-month timepoint was predictive of children's later independent memory reports. Children's reports of unique information with their mothers at 19 months and 32 months were also predictive of later independent memory. Although children's 19-month shared memory elaborations predicted their later independent memory elaborations at 25 months, this probably did not reflect true generalisation as children's independent memory elaborations were not yet stable. Children appear to be internalising both their own memory style with their mothers and their mothers' questioning style at 32 months in their independent reports of unique memory information at 40 months. These results illustrate how children consolidate their own shared memory style with their mothers prior to generalising it to their independent memory conversations. As demonstrated in previous analyses, the developmental path to children's independent memory most likely proceeds from children's 19-month placeholders and mothers' 25-month memory question elaborations to children's 32-month shared memory reports, and finally to independent memory at approximately 3-1/2 years of age.

## Chapter 9

### **Discussion I: Development of Joint Mother-Child Reminiscing and Children's Independent Memory Talk**

The results of the current study extend past research by showing that conversations about the past between mothers and children originate through bidirectional influences. At 19 months, children are just being introduced to the activity of reminiscing about the past by their mothers. In this research and in prior research (e.g. Reese et al., 1993), when the focus of children's contributions to the memory conversations is only on their provision of unique memory information, the pattern does indeed suggest that the conversations are initially mother-directed. However, when children's contributions were expanded to include their willingness to participate in conversations about the past, a different picture emerged, namely that the system is initially bidirectional. Children appear to be initially shaping their mothers' reminiscing style through their participation levels, and in turn mothers are facilitating children's willingness to participate in the memory conversations which is later transformed into children's memory elaborations. At 25 months, the memory conversations become mother-mediated with maternal memory question elaborations uniquely contributing to children's later contributions.

With regard to children's independent memory development, the results illustrate how children first become consistent in their memory reports with their

mothers prior to becoming consistent in their independent memory conversations across time. Children appear to be internalising both their own earlier memory responding with their mothers and their mothers' earlier questioning style in their later independent reports of unique memory information. The developmental progression to children's independent verbal memory begins with children's early interest in participating in the conversations and maternal reminiscing style, which together elicit children's later shared memory elaborations. Subsequently, children's shared memory elaborations and maternal reminiscing style both predict children's later independent memory at approximately 3-1/2 years of age.

Additional hypotheses contemplated other influences children might bring to the memory conversations, primarily language capabilities. There are at least three possibilities for how language may contribute to autobiographical memory (see also Fivush, 1998). First, children's verbal memory may be completely a function of language skill. The current study found that children's verbal memory and maternal reminiscing style were indeed correlated with children's language abilities. Past research has produced mixed findings on the role of language in 3 1/2 to 5 year old children's memory reports (Reese & Brown, in press; Reese & Fivush, 1993; Welch-Ross, 1997). Reese and Fivush (1993) found no relation between children's mean length of utterance (MLU) in the conversations and their memory elaborations, and Reese and Brown (in press) found no relation between children's receptive vocabulary and mother-child memory talk. Welch-Ross (1997) did find relations, however, between children's MLU and mother-child memory talk. These

conflicting findings may be due to the instability of measuring MLU from relatively brief conversation samples and with older children. Children's language abilities may be expected to play a larger role in memory talk at younger ages. The current study found such relations to be robust with children of younger ages than previously studied. It was hypothesised that expressive language facilities may play a more important role than receptive language in memory conversations; however, both receptive and expressive language abilities were related to the past event discussions. Second, maternal style could be completely a function of children's responses. Past research has shown that maternal consistency between siblings cannot be reduced to children's language development (Haden, 1998). In the current study, despite the significant correlation between language and verbal memory conversation, the relations between maternal memory question elaborations and children's shared and independent memory were not completely accounted for by children's language abilities. Maternal confirmations, however, did appear to be predominantly related to children's language abilities and to what children were saying in the immediate conversation. The long-term patterns seen in these memory conversations between maternal memory question elaborations and children's verbal memory are therefore not an artifact of children's language skill. Finally, maternal reminiscing style may be a function of mothers' general conversational style. Haden and Fivush (1996), however, found that the style that mothers displayed in past event conversations was not related to their conversational style in a free play situation. Talking about the past is therefore

more than just language skill or general maternal conversation style. Although reminiscing is conducted through the medium of language, we would argue that the primary goal of reminiscing is social rather than linguistic.

With regard to the role of child gender in mother-child memory conversations only one significant gender effect was found at the 25-month time point, with girls reporting more memory elaborations with their mothers than boys. This one result is in the same direction as those in previous research. Differences in maternal style and children's memory as a function of child gender are not always evident (e.g., Haden, 1998; Welch-Ross, 1997), but when gender differences are found, they have been in the direction of girls reporting more memory information than boys and parents of daughters being more elaborative than parents of sons (e.g. Reese et al., 1996; Haden et al., 1997). The presence of gender differences in mother-child past event conversations tends to be more robust when the focus is on the narrative organisation (e.g. Haden et al., 1997) or the emotional content (e.g. Kuebli, Butler, & Fivush, 1995) of past event talk rather than on the structure of the conversations. Recall that research with adults has demonstrated that women report richer and more vivid memories of past events and date their earliest memories back to younger ages than men (e.g. Cowan & Davidson, 1984; Mullen, 1994; Ross and Holmberg, 1990). These findings may arise from the different manner in which girls and boys are learning to talk about the past in a variety of domains with cumulative influences. Research that examines maternal beliefs or expectations about conversing about the past with children of different ages and in different



cultures would also be useful in clarifying these gender difference findings at various points along the developmental course.

Interestingly, prior to applying mediation models to the crosslag analyses, our results depicted an early mother to child directionality in the shared conversations followed by later bidirectionality. However, by examining the long-term relations in more detail using mediation tests the current study was able to show that from 25 months onwards the shared memory conversations are very much mother-directed, with mothers mediating both their own and their children's contributions to the conversations. The application of mediation models to these relationships was particularly important as it clarified the paths between mother and child over time. Additional support for these findings is provided by Peterson, Jesso, and McCabe (1999) who further demonstrated the significant role that mothers play in shared memory conversation and children's subsequent independent memory reports. Peterson et al. (1999) conducted an intervention study with mothers and their 3 1/2-year-old children. Mothers who were assigned to the intervention group were encouraged to participate in more past event conversations with their children, and in turn to ask more open-ended questions, and context related questions (e.g. when, where). The control group dyads were simply visited at the outset, conclusion, and one-year follow-up of the study, during which all of the children's language skills and narrative skills were assessed. Peterson et al. (1999) found at the conclusion of the study that the receptive language skills of the children from the intervention group had significantly improved compared to the children in the control group.

After a one-year delay, children in the intervention group were additionally recalling more information and giving more context information in their independent narratives compared to children in the control group. This research demonstrates not only that maternal conversation style in past event narratives influences children's subsequent narrative development, but also that changes in the maternal narrative style can produce changes in children's narratives.

Reese et al. (1993) found that bidirectionality did not occur between children's memory elaborations and maternal reminiscing style until the children were 58 months old. The current study used a more fine-grained measure of maternal elaborations than in Reese et al. (1993), in addition to a measure of child participation. With these adaptations, our results revealed that bidirectional relations do occur much earlier in development. The results of the current study show that children who are initially interested in participating in conversations about the past give more memory elaborations at a later point in time. Children's willingness to participate in these conversations about the past events, although they are not yet providing information, is important in the development of joint reminiscing with their mothers. The following example of one mother and child at the 19-month timepoint discussing a visit to the train station illustrates the interplay between maternal reminiscing style and children's participation:

M: Do you remember when Austin came to stay and Dorothy and Uncle Nick? And where did we go? Did we go to the train station, Hamish? Did we go to the station and see the trains, the puffer trains?

C: Na na (attentive, listening to Mum).

M: Puff puff ah. Is that what they did? And did we wave bye bye to them on the train when they went home? They went home to Gore didn't they? And we go bye bye, say bye bye Uncle Nick, bye bye Dorothy. Did we? And what did the train say?

C: Brrr brrr (attentive, listening to Mum).

M: Oh, do you remember? Was it a big blue train like Thomas?

Note that although the child is not providing much at all in the way of unique information about the event, he is taking appropriate conversational turns. His attentiveness appears to allow his mothers' conversational style to emerge because she can talk about the event instead of fighting constantly to get him to listen to her account. Notice also that her use of memory question elaborations ("And where did we go?" "And what did the train say?") is not directly contingent upon her child's responses. Again, the child's general responsiveness may enable her to ask some of these higher-level questions, thus creating the bidirectionality in very early memory conversations. Another period of bidirectionality between maternal reminiscing style and children's memory style would be predicted to follow from 58 to 70 months (Reese et al., 1993). This idea will be able to be tested with future timepoints in this study.

In concordance with past research on mother-child conversations, our mothers were consistent in their use of elaborations over time (Reese et al., 1993). Children were consistent in the provision of unique information with mothers from 2

years of age. In turn, children's provision of unique information with mothers predicted their later provision of unique information with an experimenter from as early as 2-1/2 years. Thus, the current study found stability in children's memory elaborations within and across contexts at an early age. This finding is consistent with Hudson (1993), who found relations between maternal style and experimenter-child conversations with children aged 2 to 2-1/2 years, and also previous research that has shown children are capable of independent reporting from age 3-1/2 (see Fivush & Haden, 1997 for a review). Reese et al. (1993), however, found that children were not consistent in their use of memory elaborations with mothers until 58 months. The pattern of consistent provision of memory elaborations by children that was observed between 25 and 40 months may present a qualitatively different level of remembering compared to that of older children. The children that were studied had just been introduced to the reminiscing process. Perhaps the pattern that was observed was due to children learning, literally, how to talk about the past with their mothers. This ability subsequently generalised to their independent narratives. During the later period between 40 and 58 months, several developmental transitions occur that may interrupt the consistency of children's memory reports. These developments include the acquisition of a fully-fledged theory of mind, development of a temporal sense of self, and the ability to describe oneself in evaluative terms (Perner & Ruffman, 1995; Povinelli, 1995; Welch-Ross, 1995). These processes have been shown to impact on children's ability to provide unique memory information in mother-child conversations (e.g. Welch-Ross, 1997;

Welch-Ross, 1999b). In other words, the children in this sample may later show a discontinuity in their memory reports both with their mothers and independently beyond the 40-month period. In our study, even the bidirectionality between mother and child from 32 to 40 months seemed to be decreasing, possibly pointing to a new phase in the development of shared reminiscing that will in turn be internalised into children's later independent memory talk. Also, the observed relations between children's placeholders and maternal reminiscing style appear to be disappearing by the 40-month timepoint. At these young ages placeholders appear to be particularly important in the development of joint reminiscing. However, at the older ages memory repetitions may take precedence over the placeholders and may be a more complex form that functions as an "interest to participate" variable. Continued observation of this sample at later time points will be able to address these predictions.

Placeholders in this study may be indexing children's shared attention with an adult on a conversation topic (e.g., Tomasello & Farrar, 1986; Moore, Angelopoulos, & Bennett, 1999). If so, the question becomes whether the relationships that were observed in this study with respect to children's participation are specific to conversations about personal events. These relations may instead reflect a more general learning style of the child. Future research needs to include mother-child conversations about topics other than past events to test whether the effects observed in this study are specific to autobiographical memory development.

In summary, mothers are playing an important role in the initiation and maintenance of children's autobiographical memory development through their introduction to past event conversations and by their later direction of the conversations over time. Children are also active participants in their own autobiographical memory development through their initial willingness to interact with their mothers in the memory conversations. Essentially, autobiographical memory development is a collaborative process with mothers guiding the progress. Our results fit within the framework of social-interaction theories of cognitive development (Rogoff, 1990; Vygotsky, 1978) whereby children internalise earlier interactions with parents and display them later in interactions with less familiar adults. The current study more fully addressed Vygotsky's theory, however, than previous explorations by operationalising children's interest in memory conversations. Vygotsky (1978, p. 92) noted the frequent neglect of children's interest in accounts of cognitive development when he stated, "But if we ignore the child's needs, and the incentives which are effective in getting him to act, we will never be able to understand his advance from one developmental stage to the next." The present results isolated children's early interest in reminiscing as a crucial factor in initiating the social aspect of autobiographical memory. If the current study had focused solely on children's cognitive contributions, we would have been tempted instead to conclude that these results supported a simple socialisation path from mother to child.

## Chapter Ten

### **Results II: Attachment security as a dyadic predictor of maternal style, children's memory reports, and children's participation**

The third question in this study was whether attachment security contributes to maternal style and to children's memory reports and participation in memory conversations. The current study examined whether mothers in securely attached dyads would increase the complexity of the conversations by asking for more unique information from their children. Do children who are more securely attached show a greater interest in participating in these conversations? When children show a willingness to participate as conversational partners, do mothers who are considered to be more sensitively tuned to their children scaffold the task accordingly? Do children from securely attached dyads provide more memory information with their mothers over time because of these styles of scaffolding? In turn, do these children provide more unique information when discussing the past with someone other than their mother? To answer these questions, the sample was first divided into securely attached (the top two thirds of Q-set scores) and insecurely attached (the lower one third of Q-set scores) based on prior research (e.g. Farrar et al., 1997; Park & Waters, 1989). The attachment scores ranged from  $-.11$  to  $.67$ , with a mean of  $.38$  ( $SD = .19$ ). These descriptive statistics are consistent with other research using the Attachment Q-set (e.g. Lay, Waters,

Posada, & Ridgeway, 1995; Posada, et al., 1995). Table 10.1 shows the descriptive statistics of the attachment data once the sample had been divided into secure and insecurely attached dyads. These means and ranges for the two groups are consistent with those of the Lay et al. (1995) study.

**Table 10.1**

Means (and Ranges) of the Attachment Q-set as a Function of Attachment Status

Attachment Status	
Secure (n = 39)	Insecure (n = 19)
.49 (range = .30 to .67)	.15 (range = -.11 to .27)

### Preliminary Analyses

First, the current study examined relations between attachment status and children's language abilities and gender. Children's language variables were entered into separate one-way ANOVAs with attachment status as the between-subjects factor to assess children's language abilities as a function of attachment status. The attachment status of the dyads was unrelated to children's language abilities at any time point. A one-way ANOVA with attachment as the between-subjects factor indicated that there were no gender differences in attachment status for girls or boys. Gender was not included in subsequent analyses as it was for the most part unrelated to mother-child conversation variables. Finally, Pearson correlational analyses were conducted on mother-child attachment and maternal



years of education. Attachment status was unrelated to mothers' level of education attainment,  $r = -.20$ , ns. Maternal education levels were not considered in further analyses.

### Attachment and Mother-Child Conversation Analyses

Next, the current study examined differences in mothers' and children's conversations as a function of their attachment status, and whether these relations were moderated by children's language abilities. Conversations are linguistic in nature so it is important to consider whether any observed attachment-based variations differ as a function of children's language abilities. For example, do mothers from securely attached dyads ask simpler questions when their children have low language abilities, as compared to insecurely attached mothers whose children also have lower language abilities? For the purposes of these analyses, children's productive language abilities at each timepoint were divided into high and low language levels on the basis of a median split. A series of 2 (attachment status) x 2 (concurrent productive language) between-subject ANOVAs were conducted on the mother-child conversational variables. As with the previous analyses on the past event conversations, memory question elaborations, yes-no question elaborations, statement elaborations, repetitions, and confirmations were used as the maternal conversational variables in these analyses (see Table 10.2). Children's memory elaborations and placeholders were used as the child conversational variables (see Table 10.3). It was predicted that the conversations from securely

attached dyads would contain more maternal elaborations, confirmations, memory elaborations, and placeholders compared to the conversations of insecurely attached dyads. It was also predicted that maternal use of repetitions would not differ as a function of attachment status. Only the main effects of attachment status and the interaction effects will be presented in this section because main effects of language on memory conversation variables have been discussed in the previous results section.

### Relations between Maternal Conversational Variables and Attachment Status

As can be seen from Table 10.2, 20% of the analyses were statistically significant, and all significant and marginally significant differences were in the predicted direction. Mothers from securely attached dyads gave more statement elaborations at the 40-month timepoint, asked more yes-no question elaborations at the 25- and 40-month timepoints, and confirmed more of their children's responses at the 25-month timepoint. Mothers with a secure attachment status tended to ask more memory question elaborations and to use more statement elaborations and confirmations at the 32-month timepoint, although these results were only marginal.

There were two significant language x attachment status interactions for mothers' use of repetitions ( $F(1, 57) = 5.70, p < .05$ ), and yes-no question elaborations at the 19-month timepoint, ( $F(1, 57) = 11.39, p < .01$ ). Tests for simple effects indicated that mothers from securely attached dyads whose children were in the low language group gave more repetitions ( $M = 7.91$ ) and yes-no question

elaborations ( $M = 5.91$ ) in comparison with mothers from insecurely attached dyads ( $M_s = 4.62$  and  $4.15$ , respectively), all  $F_s(1, 28) > 4.7$ ,  $p_s < .05$ . However, mothers from insecurely attached dyads whose children were in the high language group gave more yes-no questions ( $M = 9.92$ ) in comparison with mothers from securely attached dyads ( $M = 4.83$ )  $F(1, 28) = 5.95$ ,  $p < .05$ . There was a marginal language x attachment status interaction for mothers' use of statement elaborations at the 19-month timepoint,  $F(1, 57) = 3.61$ ,  $p < .10$ . Insecurely attached mothers whose children had higher language abilities at 19 months tended to give more statement elaborations ( $M = 8.42$ ) compared to mothers from securely attached dyads ( $M = 4.39$ ),  $F(1, 28) = 3.88$ ,  $p < .10$ . These results support the possibility that mothers from securely attached dyads are more sensitively tuned to their children's concurrent language abilities. It may be argued that mothers from securely attached dyads are using repetitions and simpler yes-no elaborations to encourage their children's participation in the memory conversations when the children have lower language abilities, as compared to mothers from insecurely-attached dyads. In contrast, mothers from insecurely attached dyads gave more yes-no elaborations and statement elaborations when their children had higher language abilities, which may be considered to be a less sensitive strategy. One would expect that mothers would attempt to scaffold the task in such a manner as to encourage and extend their children's abilities. In the case of memory conversations when children have higher language abilities, the expectation is for mothers to use utterances that increase the task demands for their children. Memory questions, such as "where?",

how?, and what?”, require a higher level of participation from the child than do yes-no questions or statements. In contrast, more sensitive strategies for children with lower language abilities may take the form of yes-no questions and repetitions which require lower level responses from the children.

**Table 10.2**

Maternal Conversational Variables Per Event as a Function of Attachment Status

Timepoint	Maternal Variable	Attachment Status		F value	p value
		Secure (n = 39)	Insecure (n = 19)		
		Mean (SD)	Mean (SD)		
19-months	MQ-ELAB	2.05 (1.75)	1.76 (1.63)	.00	
	YN-ELAB	5.27 (2.98)	5.97 (4.52)	1.01	
	ST-ELAB	4.77 (4.33)	5.29 (4.33)	1.27	
	REPS	6.97 (4.55)	7.97 (10.53)	.04	
	CONF	1.50 (2.43)	1.79 (5.01)	.00	
25-months	MQ-ELAB	3.92 (2.39)	3.21 (1.66)	.15	
	YN-ELAB	5.31 (2.53)	3.92 (2.14)	5.60	*
	ST-ELAB	3.21 (3.24)	2.90 (2.54)	.01	
	REPS	6.92 (4.34)	7.32 (5.33)	.02	
	CONF	3.44 (2.63)	1.53 (1.15)	6.47	*
32-months	MQ-ELAB	5.30 (2.45)	4.08 (1.52)	3.85	m
	YN-ELAB	5.04 (2.25)	4.54 (1.81)	.84	
	ST-ELAB	3.36 (2.97)	1.82 (1.83)	4.01	m
	REPS	7.13 (4.01)	7.08 (4.01)	.00	
	CONF	4.67 (2.93)	3.18 (2.77)	3.40	m
40-months	MQ-ELAB	4.55 (2.52)	3.79 (1.79)	1.01	
	YN-ELAB	4.51 (2.45)	3.14 (1.65)	4.98	*
	ST-ELAB	3.30 (3.12)	1.76 (1.68)	4.60	*
	REPS	4.29 (2.57)	4.28 (1.42)	.00	
	CONF	4.52 (2.71)	3.30 (2.16)	2.72	

<sup>m</sup> p < .10, \* p < .05

### Relations Between Child Conversational Variables and Attachment Status

Table 10.3 shows that children from securely attached dyads gave more placeholders at 19 months compared to children from insecurely attached dyads. Also, securely attached children tended to contribute more placeholders and memory elaborations at 32-months compared to insecurely attached children. It is noteworthy that securely attached children gave more placeholders at 19 months given that the previous results demonstrated how important children's 19-month placeholders were in the development of joint reminiscing with their mothers. These current results indicate that an initial interest in participating in these memory conversations by children may originate from a secure mother-child attachment relationship.<sup>2</sup>

There were two significant language x attachment status interactions for children's use of memory elaborations at 19 and 32 months,  $F(1, 57) = 5.37, p < .05$ ;  $F(1, 57) = 5.50, p < .05$ , respectively. Tests of simple effects indicated that children with higher language abilities who were insecurely attached tended to give

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<sup>2</sup> At the 19-month time point mothers were also asked to complete Buss and Plomin's (1984) EAS temperament measure for their children. The EAS consists of 20 items of behaviour descriptions with 5 point scales on which to rate how well that behaviour describes your child. A score of five on an item reflects a behaviour that is very characteristic of your child, while a score of one reflects an item that does not describe your child at all. This measure contains three indexes of temperament: sociability, emotionality, and activity.

Additional correlational analyses were conducted to show that children's use of placeholders at 19 months in past event conversations with their mothers was not a function of their temperament. Children who were more sociable, less emotional or less active did not necessarily show more interest in participating in these conversations (range  $r_s = -.02$  to  $-.24$ , n.s.).

more memory elaborations at 19 months ( $\underline{M} = 1.33$ ) in comparison with securely attached children with higher language abilities ( $\underline{M} = .36$ ),  $\underline{F}(1, 28) = 4.04$ ,  $p < .10$ . In contrast, at 32 months, securely-attached children from the higher language group gave more memory elaborations ( $\underline{M} = 4.95$ ) in comparison with insecurely attached children from the same language group ( $\underline{M} = 2.00$ ),  $\underline{F}(1, 28) = 11.07$ ,  $p < .01$ .

**Table 10.3**

Children's Conversational Variables per Event as a Function of Attachment Status

		Attachment Status					
		Secure (n = 39)		Insecure (n = 19)			
Timepoint	Child Variables	Mean	(SD)	Mean	(SD)	F value	p value
19-months	Me	0.29	0.66	0.47	1.01	2.75	
	PL	1.69	2.04	0.53	0.66	6.11	*
25-months	Me	2.53	2.24	1.36	1.55	2.28	
	PL	2.05	2.46	1.15	1.35	2.73	
32-months	Me	4.00	2.85	2.63	1.94	3.93	m
	PL	3.04	2.93	2.02	3.29	3.67	m
40-months	Me	4.81	2.97	3.74	2.28	2.10	
	PL	2.58	2.43	1.99	1.13	.11	

<sup>m</sup>  $p < .10$ , \* $p < .05$

### Attachment and Children's Independent Memory Analyses

Next, the current study examined the differences in children's independent memory as a function of attachment status. Again language was examined as a moderator variable as in the previous analyses. A series of 2 (attachment status) x 2 (concurrent productive language) between-subject ANOVAs were conducted on the amount of information that children were recalling independently with an experimenter, with experimenter prompts controlled for (see Table 10.4). It was predicted that if differences were present in children's independent recall as a function of attachment status then it would be in the direction of securely attached children recalling more information independently with an experimenter as compared to insecurely attached children. Again, only the main effects of attachment status and the interaction effects will be presented in this section as the main effect of language on children's independent recall has been discussed in the previous results section.

As can be seen from Table 10.4, children from securely attached dyads recalled more information with an experimenter at 32 months compared to children from insecurely attached dyads. There were no differences in independent recall as a function of attachment status at 25- and 40- months. There were no significant language x attachment status interactions. In summary, when there is a difference in children's independent recall, it was in the direction of securely attached children recalling more information. However, the pattern does not continue through to the 40-month timepoint. It appears that this significant difference may be the result of

the initial differences seen in mother-child conversations about the past with respect to attachment status, that then initially set the stage for children's independent reminiscing. The contribution of the mother-child attachment relationship may only contribute to the early phase of independent reminiscing.

**Table 10.4**

Children's Independent Memory Elaborations per Event as a Function of Attachment Status

	Attachment Status		F value	p value
	Secure (n = 39)	Insecure (n = 19)		
	Mean (SD)	Mean (SD)		
25 month independent memory elaborations	.09 (.11)	.07 (.14)	.01	
32 month independent memory elaborations	.24 (.35)	.08 (.10)	4.47	*
40 month independent memory elaborations	.38 (.59)	.27 (.34)	.28	

\*  $p < .05$ .

#### Attachment Status and Maternal Differential Responses in Memory Conversations

Do mothers differ in their responses to children's use of placeholders and



memory elaborations as a function of their attachment status? Specifically, are mothers more likely to ask memory question elaborations or use repetitions following a placeholder as a function of the dyads' attachment relationship? The current study would predict that securely attached mothers would be more likely to respond to a placeholder with a memory question elaboration compared to mothers from insecurely attached dyads. Furthermore, the current study would predict that mothers from the insecurely attached dyads will provide more repetitions following a placeholder. Based on previous research of mothers' contingent replies to children's memory elaborations, mothers' contingent responses to children's memory elaborations are not expected to vary as a function of attachment status (see Reese et al., 1993). Instead, it is expected that all mothers would show a similar style of responding to their children's provision of unique information. It is most likely that all mothers will follow their children's recall of unique information with an elaboration.

The contingency coding was conducted as follows. Maternal codes that followed children's placeholders and memory elaborations were tallied. However, only the last utterance of interest in each child turn was tallied. For example, if a child responded with a memory elaboration and then a memory repetition within a turn, then the subsequent maternal code would not be added to the contingency counts. This is because the maternal code is contingent on the child's memory repetition which was not being tallied in this coding procedure. Similarly, two memory elaborations by a child within a turn would only receive one credit for the

subsequent maternal response. In tallying the maternal codes, the following maternal categories were included: memory question elaborations, yes-no question elaborations, statement elaborations, repetitions, confirmations, and an “other” category which included all additional codes that occurred and were not covered by the previous categories. In general, the first maternal code following children’s placeholders or memory elaborations was tallied. The exception to this was when a mother gave a confirmation and then within the same turn gave a subsequent elaboration or repetition, in which case the subsequent code was tallied. Also, when a mother’s contingent turn began with an inconsequential code, e.g. a remember prompt or an off topic comment, and was followed by an elaboration or a repetition, the subsequent code was recorded.

Contingency analyses were then conducted on the mother-child conversations to examine whether mothers would differ in their responses to children’s placeholders and memory elaborations as a function of their attachment status. Proportions were calculated for all mothers’ responses contingent on their children’s placeholders and memory elaborations. The current study was most interested in the probabilities of mothers’ use of memory question elaborations and repetitions in response to memory elaborations and placeholders, and therefore these are the only two variables reported. Children did not contribute memory elaborations and placeholders to every conversation, however, so the analyses are conducted on reduced sample sizes (see Table 10.5).

**Table 10.5**

Sample Size for the Contingency Analyses Across Time as a Function of Attachment Status

	Attachment Status			
	Secure (n = 39)		Insecure (n = 19)	
Timepoint	ME	PL	ME	PL
19-months	10	26	5	10
25-months	32	35	12	13
32-months	39	37	16	15
40-months	38	35	18	18

Table 10.6 shows the mean proportions of maternal memory question elaborations and maternal repetitions in response to children's memory elaborations across time. The proportions do not add to 1 as mothers also responded with other conversational variables that were not included in these analyses. A series of one-way ANOVAs with gender as the between-subjects factor were first conducted on the contingency data across all timepoints. Gender was unrelated to the contingency data at any timepoint. Therefore gender was not considered further in these analyses. Separate 2 (attachment status) x 2 (children's productive language) ANOVAs were conducted on each maternal contingent response at each timepoint (see Table 10.6).

**Table 10.6**

Mean Proportions of Maternal Conversational Variables Contingent on Children's Memory Elaborations as a Function of Attachment Status Over Time.

Timepoint	Maternal Variables	Attachment Status		F value	p value
		Secure (n = 39)	Insecure (n = 19)		
19-months	MQ-ELAB	.00 (.00)	.04 (.09)	1.40	
	REPS	.31 (.42)	.04 (.09)	1.16	
25-months	MQ-ELAB	.15 (.15)	.16 (.29)	.01	
	REPS	.16 (.19)	.28 (.32)	2.46	
32-months	MQ-ELAB	.21 (.17)	.28 (.26)	1.47	
	REPS	.19 (.18)	.15 (.16)	.23	
40-months	MQ-ELAB	.25 (.21)	.24 (.17)	.09	
	REPS	.10 (.10)	.24 (.24)	8.39	**

\*\*  $p < .01$

As expected, mothers responded in a similar manner to children's memory elaborations across time. An exception to this pattern, however, was that at the 40-month timepoint mothers from insecurely attached dyads were more likely to respond to a memory elaboration with a repetition compared to mothers from securely attached dyads. Although this result was not predicted, it is in keeping with the hypothesis that mothers from insecurely attached dyads would not be as sensitively tuned to their children's conversations. Responding to a child's memory elaboration with a repetition cannot be regarded as a collaborative co-construction of reminiscing. Essentially, the mother appears to be ignoring the child's

contribution to the conversation, and continuing to direct the conversation in the direction that she has judged as appropriate (see Discussion for an example).

Finally, there was one main effect of children's language abilities on maternal responses contingent on children's memory elaborations at the 32-month timepoint. Mothers of children in the low language group gave more repetitions following children's memory responses ( $\underline{M} = .25$ ) compared to mothers of children in the high language group ( $\underline{M} = .11$ ),  $\underline{F}(1, 54) = 12.46$ ,  $p < .01$ . There were also two marginal interactions between attachment status and children's language abilities for mothers' contingent responses on children's memory elaborations at the 32 months timepoint; mothers' use of memory question elaborations,  $\underline{F}(1, 54) = 3.45$ ,  $p < .1$ , and mothers' use of repetitions,  $\underline{F}(1, 54) = 2.91$ ,  $p < .1$ . Simple effects indicated that children in the low language group who were insecurely attached had mothers who gave more memory question elaborations following a memory elaboration ( $\underline{M} = .34$ ) compared to their securely attached counterparts ( $\underline{M} = .16$ ),  $\underline{F}(1, 28) = 5.87$ ,  $p < .05$ . In contrast, securely attached children from the high language group had mothers who gave more repetitions following their children's memory elaborations ( $\underline{M} = .15$ ) compared to their insecurely attached counterparts ( $\underline{M} = .04$ ),  $\underline{F}(1, 28) = 6.21$ ,  $p < .01$ . This is contradictory to what was expected.

Table 10.7 shows the mean proportions of maternal memory question elaborations and maternal repetitions in response to children's placeholders across time. Again, the proportions do not add to 1 because mothers also responded with other conversational variables that were not included in these analyses. Separate 2

(attachment status) x 2 (children's productive language) ANOVAs were conducted on each maternal contingent response at each timepoint (see Table 10.7).

Mothers in the secure attachment group were more likely to respond to children's placeholders with memory question elaborations at the 19-, 25-, and 32-month timepoints compared to mothers from the insecure attachment group. However, the findings that mothers gave more memory question elaborations at the 19- and 25-month timepoints were marginal. In turn, mothers in the insecure attachment group were more likely to respond to their children's placeholders with repetitions at the 25-, 32- and 40-month timepoints. However, the findings that mothers gave more repetitions at the 32- and 40-months timepoints were marginal. Overall, these results indicate that when children with secure attachment relationships display a willingness to participate in the conversation, their mothers are more likely to elaborate and ask their children to provide more information. In contrast, mothers from insecure attachment dyads are more likely to repeat previous information or questions when their children indicate an interest in the conversation.

**Table 10.7**

Mean Proportions of Maternal Conversational Variables Contingent on Children's Placeholders as a Function of Attachment Status Over Time.

Timepoint	Maternal Variables	Attachment Status		F value	p value
		Secure (n = 39)	Insecure (n = 19)		
		Mean (SD)	Mean (SD)		
19-months	MQ-ELAB	.05 (.10)	.00 (.00)	2.88	m
	REPS	.37 (.35)	.24 (.27)	.85	
25-months	MQ-ELAB	.17 (.23)	.03 (.05)	3.81	m
	REPS	.22 (.28)	.51 (.34)	7.85	**
32-months	MQ-ELAB	.21 (.23)	.06 (.10)	6.10	*
	REPS	.31 (.28)	.49 (.32)	3.45	m
40-months	MQ-ELAB	.16 (.15)	.14 (.26)	.01	
	REPS	.26 (.25)	.38 (.22)	2.94	m

<sup>m</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$

There were no significant main effects of language on the contingency data. There was one significant interaction between attachment status and children's language abilities for mothers' use of memory question elaborations following children's placeholders at the 40-month timepoint,  $F(1, 52) = 5.53$ ,  $p < .05$ . Simple effects indicated that mothers from securely attached dyads whose children were in the low language group were using more memory question elaborations following

children's placeholders ( $\underline{M} = .20$ ) compared to mothers from insecurely attached dyads with children in the low language group ( $\underline{M} = .07$ ),  $\underline{F}(1, 24) = 4.62$ ,  $p < .05$ . It appears that secure attachment is acting as a protective factor in this situation, whereby mothers are still encouraging their children's participation by using elaborations, despite their children's low language abilities. In accordance with Meins' (1998) findings, mothers from securely-attached dyads may be more likely to attribute meaning or purpose to their children's placeholders and thus give a higher order response to them compared to mothers from insecurely attached dyads.



## **Chapter 11**

### **Discussion II: Origins of Mother-Child Memory**

#### **Conversation Structure**

Attachment is a measure of how the dyad interacts and therefore provides an indication of the “fit” between mother and child as seen through maternal sensitivity to the child's needs. A secure attachment relationship appears to facilitate a positive learning environment, as the interactions are not tempered by negative communications or actions, e.g. disciplinary instructions (Bus & van IJzendoorn, 1992). In this study, mothers’ use of elaborations differed as a function of attachment status. Specifically, mothers from securely attached dyads tended to use more elaborative utterances compared to mothers from insecurely attached dyads. Also, children from securely attached dyads were more likely to use more placeholders and give more memory elaborations compared to children from insecurely attached dyads. In turn, children from securely attached dyads also gave more independent memory elaborations at 32 months compared to their insecurely attached counterparts. These findings extend those results mentioned in the Chapter 8, where the importance of children’s use of placeholders at 19 months for the development of joint reminiscing was demonstrated.

Children’s language abilities acted as a moderator for only a few attachment-memory relations. At the 19-month timepoint, mothers who had securely attached

children with low language abilities used more yes-no questions and repetitive utterances in comparison to mothers of insecurely attached children with similar language levels. Mothers of insecurely attached children with higher language abilities however used more yes-no questions compared with their securely attached counterparts at the 19 month timepoint. In contrast to what was expected, insecurely attached children in the high language group tended to give more memory elaborations compared with securely attached children at the 19-month timepoint, although this was a marginal result. Interestingly, however, securely attached children in the high language group gave more memory elaborations at the 32-month timepoint compared to insecurely attached children with the same language abilities. It appears as though mothers at 19 months in securely attached dyads are scaffolding the task in a more sensitive manner by using utterances that require a simpler response by the child, e.g. “yes” or “no”, or by using repetitions, to remind the child of what was asked when the child has low language abilities. However, when children have better language abilities it might be expected that mothers would extend the demands on the child within memory conversations by using memory questions rather than yes-no questions. Over time securely attached children do give significantly more information, perhaps because of these earlier styles of scaffolding. It may be argued that mothers from securely attached dyads are more “sensitive” to their children’s current learning potential and therefore, scaffold accordingly. Insecurely attached children did however, give marginally more memory elaborations at 19 months. However, as children are not stable in

their use of memory elaborations at this age, it is difficult to know whether this is a reliable finding.

The first results section demonstrated that children who were initially interested in participating in these past event conversations gave more memory elaborations at a later point in time both with their mothers and independently. These current results now show that these children are in fact more likely to be securely attached. The attachment relationship is logically prior to the initiation of past event conversations, thus it would appear that a secure attachment relationship may be enabling the progress of the development of joint reminiscing. The finding that securely attached children were recalling more information with an experimenter at 32 months compared to insecurely attached children, may have resulted from the foundation that is set by the mother-child attachment relationship.

The primary focus of this results section was to investigate what was occurring within these conversations with respect to attachment security. The conversation frequency data do not reveal how mothers are structuring these memory conversations with respect to their children's comments. Thus, contingency analyses were conducted to examine maternal utterances within the context of the conversations. The current study predicted that when children from securely attached dyads indicated that they were willing to participate in these conversations, their mothers would be more likely to respond with elaborations. Meanwhile mothers from insecurely attached dyads would be more likely to respond with repetitions when their children show a willingness to participate in the

conversation. Indeed, mothers from securely attached dyads did tend to provide more memory question elaborations following their children's use of placeholders at the 19-, 25- and 32-month timepoints. Mothers from insecurely attached dyads tended to use repetitive utterances following their children's use of placeholders at 25-, 32-, and 40-month timepoints. Children's language abilities were unrelated to mothers' contingent replies on children's placeholders. However, mothers from securely attached dyads whose children had lower language abilities were more likely to ask memory question elaborations following a placeholder from their children at 40 months compared with their insecurely attached counterparts. In turn, it was not expected that mothers' contingent replies on children's memory elaborations would differ as a function of attachment status. As expected, mothers responded in a similar manner to children's memory elaborations across time. An exception to this pattern, however, was that mothers from insecurely attached dyads were more likely to respond to their children's memory elaborations with repetitions at the 40 month timepoint. Children's language abilities were related to maternal use of repetitions at the 32-month timepoint: mothers whose children had lower language abilities gave more repetitions compared to mothers of children with high language abilities. Finally, children's language levels moderated the relation between attachment and maternal contingent responses to children's memory elaborations at the 32-month timepoint. Following memory elaborations mothers from securely attached high language level dyads gave more repetitions, while mothers from insecurely attached low language level dyads gave more memory

question elaborations. This is contradictory to what was expected.

Overall, mothers from securely attached dyads appear to be structuring past event talk with their children in a manner that may be labelled as "sensitive" for this task. The critical difference between mothers as a function of attachment status is how they respond to their children's indication that they are willing to participate in these conversations. Mothers from securely attached dyads provided more memory question elaborations in response to children's placeholders in contrast to mothers from insecurely attached dyads who provided more repetitions. The placeholder functions as a turn in the conversation that indicates willingness to participate but the child is unable to recall information or provide what the mother wants. It appears that the most appropriate response to these placeholders is for mothers to continue to provide information for their children, in order to assist the child in co-constructing the event with the mother. This response is more appropriate than continuing to provide information which the child has already received, or to ask questions that the child has not been able to answer. The use of repetitions following a placeholder cannot be viewed as beneficial to the development of joint reminiscing. Below are two excerpts from the current study's pool of mother-child transcripts which illustrate the difference between mothers' contingent replies as a function of attachment status.

Example 1: Securely-attached mother-child dyad at the 32-month timepoint discussing the arrival of a concrete mixer at their house.

M: 'kay do you remember when the concrete mixer came? To put concrete for the garage?

C: Mm.

M: What did it do?

C: Um the truck full of dirt.

M: Mm hh.

C: A truck full of dirt.

M: And where did it go?

C: To the builders.

M: Mm hh.

C: And.

M: And then what did the builders do?

C: Poured it and eh.

M: How did it get to the garage?

C: Where's . where.

M: From the truck?

C: Umm.

M: What did they have to do with the concrete when it was finished?

C: I don't know. It it was it was a sticky concrete.

M: Right. A sticky concrete.

Example 2: Insecurely attached mother-child dyad at the 32-month timepoint

discussing a concert with a well-known television children's show presenter.

M: ...Do you remember going and seeing Suzy? (pause) Hmm? And who was with us?

C: I don't know.

M: Who came with us? Who went with us when we watched Suzy?

C: I don't know.

The mother then asked the child about the next past event topic.

At the conclusion of this conversation the mother commented, "You don't know. Mm. That's a bit sad isn't it?" The mother in this example appeared to be putting the onus on her child to recall specific information rather than structuring the discussion as a joint reminiscing task. This occurred despite the child taking appropriate conversational turns throughout the conversation. In comparison, the mother in the first example encouraged her child to recall information when he has indicated a willingness to participate in the conversation. The mother did this by continuing to elaborate and extend the conversation to aid the child's recall of the event. Notice that the mother in the first example received information from her child that she had not specifically asked for and when this occurred she continued to elaborate rather than repeat her previous question. There appeared to be no expectation from this mother that her child would give her specific information about the event as opposed to the second transcript example.

The current study theorised that variations in maternal style as a function of

attachment status may demonstrate differences in maternal sensitivity. Additional support for this was shown by the finding that insecurely-attached mothers also tended to ask more repetitions following the provision of information from their children. Continuing to ask or to report information that has already been provided in response to the provision of unique information by the child cannot be seen as sensitive scaffolding of the conversation. If the mother is directing the conversation by continuing to ask the child for information that has already been asked, joint reminiscing is not allowed to develop. Excerpts from an insecure dyad and a secure dyad are given below to illustrate the differences in maternal reminiscing style as a function of attachment status.

Insecurely attached mother-child dyad at the 40-month timepoint discussing a family fishing trip.

M:...and what'd Uncle Mark take with him?

C: Fish

M: Yeah but what'd he take with him?

C: Two fish

M: What'd Uncle Mark take with him on the back of the truck?

C: Dog

M: It was a boat

In contrast, a conversation from a securely attached dyad at the 40-month



timepoint discussing a farm visit.

M: What was the farmer's name?

C: I don't know.

M: Can you not remember?

C: No.

M: Do you remember who..

C (interrupts mother) I ate all the lollie.

M: Yeheh that's it they had lots of lollies. They did too.

C: And a farm and a lawnmower, and a big bike.

M: (laughs)

C: Did it?

M: Yeheh. They had a big four wheeler. And then they had a motor bike that um (pause) they had a lawn mower.

C: Yeah.

M: And you rode around on it.

C: Yeheh.

M: Yeh you remembered all that.

C: And it broke because Amy 's being naughty.

M: Yeh but yes it did didn't it?

C: Yeah and Amy's been naughty and she broke it.

M: How many dogs did they have? Can you remember?

C: Holds up three fingers.

M: They did too. Very good. They had three. Well done. And do you remember what else we saw?

C: Um all the doggies went around the alley and said woof woof woof. And then and then then they smacked the big big doggie aye?

M: Cos he was naughty.

C: Yeah cos he had been on the grass and chase the sheep around.

M: He did. Now do you remember what other animals we saw?.....

The conversation above demonstrates the co-construction of a conversation about a shared past event. The mother and child appear to be both enjoying the conversation and a great number of details are being remembered by both conversation partners. In contrast the first conversation lacks the richness of the second discussion. Instead of being a joint conversation about the event, the reader may perceive that the mother's aim is for her child to recall particular details that she believes to be important about the event. These two different styles of discussing personal memories have implications for the period of childhood amnesia, which will be discussed in more detail in the proceeding chapter.

Over time attachment security may not be expected to play as dominant a role in the structure of past event conversations as demonstrated in these results. There are several possible explanations as to why the effects appear to be disappearing at the 40-month timepoint. At these young ages placeholders appear to be particularly important in the development of joint reminiscing. Over time, children's placeholders do not appear to be as important in joint reminiscing (see Chapter 8).

The function of placeholders may change over time. Initially they appear to function as an "interest in participating" variable; however, at older ages other conversational variables may take over this function. Attachment security may also function to initiate mothers' development of scaffolding for past event conversations. Over time, however, as children become more adept conversationalists, mothers still participate by providing more elaborations (Reese et al., 1993). Other factors may dominate maternal style of past event conversation at these older ages (e.g., development of theory of mind). Similarly attachment security may play a larger role in the development of other skills involved in the task of talking about the past, for example, emotional content.

Children's gender was unrelated to attachment security or to the mother-child conversational variables and therefore was not considered in the analyses. Previous research has shown that gender interacted with attachment security in relation to mother-child memory talk (Farrar et al., 1997). Our study, however, examined the structure of memory conversations, whereas Farrar et al. (1997) investigated their emotional content. The memory conversations in the current study did not contain many references to emotions; perhaps when the children are older, the content of memory conversations could be examined in more detail for emotional content<sup>3</sup>.

Future research in this area also needs to examine how mothers and children

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<sup>3</sup> We coded for mothers' and children's use of emotion words in the past event narratives from the 19- to 40-month timepoint. The frequency of these words was extremely low, and therefore the data was not included in this study. We expect that the frequency of emotion words in the past event conversations would increase over time (e.g. Kuebli, Butler, Fivush, 1995).

of different attachment securities experience the initial past events. We do not know if the attachment status of the dyads affects how the event is first experienced. The event may appear to be a positive and enjoyable event, for example, feeding ducks, but an insecurely attached dyad may experience that event in a different manner to a securely attached dyad. Feeding the ducks for the insecurely attached dyad may have concentrated on the child crying because he was surrounded by ducks, running away from his mother, or being told off for eating the bread himself. It must also be acknowledged that the current study measured maternal perceptions of the attachment relationship, which may limit the generalisability of these findings. Teti and McGourty (1996) found that mothers were reliable sorters of their children's attachment security, compared to observer sorts, when mothers had familiarised themselves with the attachment Q-set items and the relation between the items and their children's behaviour. It was also beneficial if the mothers were supervised in the actual sort by a trained experimenter. Both of these conditions were satisfied in this current study. Also, studies of attachment security and children's cognitive skills have shown similar results regardless of whether the Strange Situation procedure or the Attachment Q-set was used (e.g. van der Veer & van IJzendoorn, 1988; Moss et al., 1993).

In conclusion, securely attached children demonstrated a greater willingness to participate in these conversations about the past and subsequently produced more unique memory information in comparison to insecurely attached children. In turn, mothers from securely attached dyads appeared to be scaffolding the conversations

in a manner that assisted their children to jointly participate in the discussion, through the provision of maternal elaborations. These findings extend those presented in Chapter 8 by demonstrating the importance of the mother-child dyadic relationship with regard to the development of joint reminiscing.

## Chapter 12

### Conclusion

*"It's a poor sort of memory that only works backwards, the Queen remarked."*

Lewis Carroll (1896, p.130)

The primary goal of this research was to examine the origins of children's autobiographical memory within a social interactionist model. The fundamental component of this model is that children are learning about the importance of their personal memories through conversations about these events with others. The current study examined children from when they were 19 months old, an age at which children are literally just learning to talk about the past with others. The study finished when these children were 40 months old, an age that coincides with the average age for the offset of the childhood amnesia period. At this age the children in this sample were displaying an independent memory style when conversing with others. The current research investigated the relations between mothers' and children's joint conversation structure, concurrently and longitudinally, and also the relation between the shared memory conversations and children's independent reports of unique information. In addition, the current study examined the possibility that a dyadic construct, mother-child attachment status, may relate to the development of joint reminiscing.

In summary, the findings of this study were that mother-child conversations about the past appear to originate with bidirectional relations (see Figure 12.1). Children's use of placeholders at 19-months shape maternal style, and maternal style facilitates children's placeholders which are later transformed into memory elaborations at 32-months. At 25-months the conversations appear to be mother-mediated. With regard to children's independent memory, children are first consistent with their recall of unique information with their mothers at 2/1/2 years before they become consistent in their independent memory which occurs by 3/1/2 years. Children appear to be internalising both their earlier memory responding and mothers' earlier questioning style in their later independent accounts of personally experienced events. In contrast to previous research, this study demonstrated that even young children are active participants in their own verbal memory development, and through their interest in participating are contributing to their mothers' conversational style from a very early age.

The potential role of the emotional bond between mothers and children in the development of joint reminiscing was examined in the current study in order to extend our knowledge of what other factors may contribute to memory conversations about the past. Interestingly, a secure attachment status was related to children's interest in participating in the memory conversations at 19-months (see Figure 12.1). As discussed above, this is an important conversation variable in terms of the development of children's reminiscing abilities. Further analyses showed that mothers who were from a securely attached dyad were more likely to

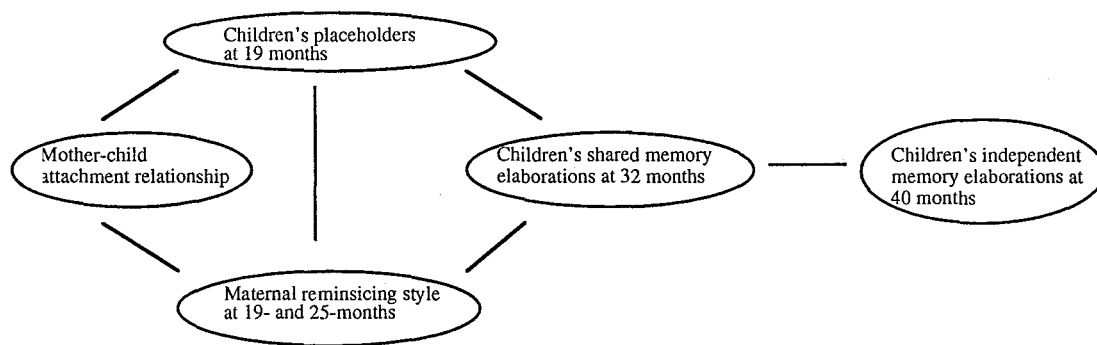
follow children's use of placeholders with an elaboration in comparison to mothers from insecurely attached dyads who were more likely to follow with a repetition (see Figure 12.1). The concept of maternal sensitivity is highlighted by the relation between attachment status and maternal contingent replies to children's indication of interest in continuing the memory conversations. Ainsworth et al. (1971) described "maternal sensitivity" as mothers who were able to respond to their infants' signals promptly, accurately, and appropriately. In contrast, mothers who were classified as "insensitive" interpreted their infants' signals in terms of the mothers' needs or would not respond to the infant at all. In these memory conversations, mothers' responses to children's placeholders would appear to index maternal sensitivity as it relates to joint reminiscing. A mother may demonstrate sensitivity by following her child's indication of interest in the conversation with an elaboration.

These results have been interpreted with respect to mother-child memory conversations about the past. These results also lend themselves to other situations outside of the domain of autobiographical memory development. The current study may have observed a general learning ability of children, which was indexed in this study by children's use of placeholders (see Chapter 9). Similarly, maternal sensitivity is a construct that one would expect to impact on other dyadic situations, for example, within a joint problem-solving task. These results may, therefore, generalise to other paradigms of learning. Future research could test this possibility by examining mother-child conversations about topics other than past events.



Maternal reminiscing style, however, has been shown to be specific to conversations about the past (Haden and Fivush 1996). In turn, maternal sensitivity may influence other dyadic situations. However, the findings associated with the attachment relationship in the current study may be specific to the context of memory conversations.

The application of mediation models to mother-child memory conversations is an innovative step in examining the relations in joint reminiscing. In the present study this application clarified the pathways between mothers and children within the memory conversations. If these analytical procedures had not been applied, the current study would have been tempted to conclude that the pathway to joint reminiscing is mother-mediated. Also, by examining other factors (for example, attachment status), a more comprehensive picture of how joint reminiscing is initiated and developed emerges.



**Figure 12.1** Proposed model of autobiographical memory development.

This model includes only the variables that were examined in the present study. There are other factors that may contribute to the development of autobiographical memory, which are not considered in the Figure 12.1 as they were beyond the scope of this study.

Joint reminiscing between mothers and children is the process by which children learn both the relevance and the method of conversing about their previous personal experiences. The maternal style of past event conversation has implications for the phenomenon of childhood amnesia. Mothers who describe past experiences in vivid detail are more likely to have children who will recall more information in their own independent narratives. In contrast, other mothers tend to repeat or ask for the same information, irrespective of the child's participation, in order for the child to recall information about the event, which the mother has perceived to be an important aspect.

Do mothers who are more elaborative in past event conversations more readily infer that children have their own perspective of the event? Perhaps variations in mothers' attributions of a theory of mind to their children may differ along the maternal style dimension. This proposal for the development of an independent autobiographical memory is different to that which Welch-Ross (1999a) advocates. Welch-Ross proposes that children are unable to benefit from the maternal style of reminiscing about the past until they have developed specific cognitive tools, including representational skills of the origins of knowledge, and the understanding that the child and others can have differing mental representations of an event. The data from the current study do not support this proposition, but

instead demonstrate that children as young as 19 months appear to benefit from their mothers' style of reminiscing. Instead it is proposed that the representational skills, which Welch-Ross argues as being important for the development of autobiographical memory, may actually already be influential through the presence of these skills in mothers. Mothers may vary in the degree to which they believe or allow the child to have a different representation of the event compared to their own representation of the event. These variations in mothers' inferences of children's representational abilities may then influence maternal reminiscing style. Specifically, mothers may then allow their children to discuss aspects of the event, which they can recall or found interesting rather than focus exclusively on what the mother found intriguing about the experiences. Will it follow that these children are then able to recall this event in more detail in later years compared to children with whom adults discussed the events with a focus on what they believed was important for the child to recall? Chapter 10 gives such examples where the conversations are richer in detail when the child and mother jointly reminisce about aspects of the event, which they both found interesting or important to recall, compared to children whose mothers appeared to dictate the course of the conversation.

If mothers perceive the child to have their own representation about the event which may differ from their own, will these children then benefit more from the conversations as they reflect a more collaborative approach to reminiscing? The development of metarepresentational abilities in children is obviously an important milestone with regard to autobiographical memory development. In accord with

other theorists (e.g. Howe & Courage, 1993; Perner 1991), the advances in children's social cognition, for example theory of mind, and an evaluative sense of self, may further contribute to the quality of joint reminiscing e.g. inclusion of emotional content and promotion of children's temporal organisation of their narratives. The present study examined the early development of autobiographical memory in children from 19 months through to 40 months. The current investigation finished when children were reaching an age at which one might expect to observe a noticeable progression in the quality of their memory recounts of personal experiences. The current research does not support Welch-Ross's (1999a) theory that the presence of certain metarepresentational skills in children are necessary for children to benefit from maternal reminiscing style. These skills, however, will certainly play a role in the development of children's narrative quality.

With regard to other theories of autobiographical memory development, Pillemer and White (1989) and Hudson (1990) proposed the social interaction theory. Primarily this theory suggests that children learn the conventions of recalling personal events with others through conversations about the past with adults. Pillemer and White (1989) believe that the autobiographical memory system emerges when children are able to actively engage in conversations about the past with others. The current study would suggest that children are actively engaging in past event conversations from the beginning through their interest in participating in these conversations, although adults continue to support them in this

task. In accordance with Pillemer and White's (1989) theory, the current study suggests that the autobiographical memory system emerges when children first begin discussing experiences from the past.

Nelson (1996), however, argues that autobiographical memory development hinges on the availability of language as a representational tool, not simply for communication purposes. Although children are able to engage in conversations about the past early in childhood, Nelson (1996) proposes that it is not until later in the preschool years that children are able to competently use language as a representational device. Children's ability to use language for representation relies on them being able to understand that a verbal account of an event by another person is a representation of the original event, and may be included in their representation of the event. Nelson (1996) does, however, allow for the progression of language as a representational tool which becomes increasingly complex over the childhood period. She proposes that children by the age of two, can transform their experience of an event into an appropriate verbal form to discuss with another person. Therefore, while the use of language as a representational tool develops, it may be expected that the development of autobiographical memory skills would also progress. Once children are of preschool age, it may be expected that the combination of prior adult-child conversations about the past, the development of increasingly complex representational language abilities, and the onset of more advanced social-cognitive skills (e.g. theory of mind) will improve the quality of children's past event narratives.

Returning to the proposition that mothers may differ in their attributions of representational capabilities to their children, this may in turn influence their conversations about the past with their children. Are mothers' attributions of children's theory of mind abilities influenced by their goals for engaging in these past event conversations? What entices mothers to reminisce with their children? Is it to help children understand their place in the family, is it for educational purposes to aid their cognitive development, is it to teach them how to socialise, or is it to ensure that family history is passed down the generations? Mothers may be potentially endowing their children with their beliefs and expectations of the importance of personal memories. Those mothers with educational goals or performance-based goals for the activity would adopt a less elaborative style. In contrast, mothers who reminisce to describe family history and the child's place in the family would be expected to be more elaborative when discussing the past. Previous research has been unable to answer these questions. Future research investigating mothers' reasons for talking about the past may aid our understanding of the origins of mothers' and children's reminiscing, and ultimately children's autobiographical memory development.

Autobiographical memory is our own personal life history, which develops primarily through joint reminiscing. The enduring emotional bond which develops between mothers and children during the first year of life appears to "set the stage" for later learning. In particular, maternal sensitivity appears to play an important role in mother's reminiscing style, which in turn enhances children's verbal

memory development. Parents may initiate the process of using reminiscing as a social activity that defines who you are to others, but children shape this process and their own later reminiscing from its inception. The current research addresses some of the maternal and child characteristics that influence how joint reminiscing between mothers and children is initially formulated, and in turn how autobiographical memory develops.

## References

Ainsworth, M. D. S. (1963). The development of infant-mother interaction among the Ganda. In B. M. Foss (Ed.), Determinants of infant behavior (Vol. 2, pp. 67-104). London: Methuen & Co Ltd.

Ainsworth, M. D. S. (1969). Object relations, dependency, and attachment: A theoretical review of the infant-mother relationship. Child Development, 40, 969-1025.

Ainsworth, M. D. S. (1973). The development of infant-mother attachment. In B. M. Caldwell & H. N. Ricciuti (Eds.), Review of child development research (Vol. 3, pp. 1-94). Chicago: The University of Chicago Press.

Ainsworth, M. D. S. (1979). Attachment as related to mother-infant interaction. In J. S. Rosenblatt, R. A. Hinde, C. Beer, & M. Busnel (Eds.), Advances in the study of behavior (Vol. 9, pp. 1-51). New York: Academic.

Ainsworth, M. D. S., Bell, S. M. V., & Stayton, D. J. (1971). Individual differences in strange situation behavior of one-year-olds. In H. R. Schaffer (Ed.), The origins of human social relations (pp. 17-52). London: Academic Press.

Ainsworth, M. D. S., Blehar, M., Waters, E., & Wall, S. (1978). Patterns of attachment: A psychological study of the Strange Situation. Hillsdale, NJ: Erlbaum.

Ainsworth, M. D. S., & Bowlby, J. (1991). An ethological approach to personality development. American Psychologist, 46, 333-341.



Ainsworth, M. D. S., & Wittig, B. (1969). Attachment and exploratory behavior of one-year-olds in a strange situation. In B. M. Foss (Ed.), Determinants of infant behavior, (Vol. 4, pp. 113-136). London: Methuen & Co Ltd.

Bachevalier, J., & Mishkin, M. (1984). An early and late developing system for learning and retention in infant monkeys. Behavioral Neuroscience, 98, 770-778.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 51, 1173-1182.

Bauer, P. J., & Wewerka, S. S. (1995). One-to-two-year-olds' recall of events: The more expressed, the more impressed. Journal of Experimental Psychology, 59, 475-496.

Belsky, J., Spritz, B., & Crnic K. (1996). Infant attachment security and affective-cognitive information processing at age 3. Psychological Science, 7, 111-114.

Bender, L., & Yarnell, H. (1941). An observation nursery: A study of 250 children on the psychiatric division of Bellevue hospital. American Journal of Psychiatry, 97, 1158-72.

Bergson, H. (1922). Creative Evolution (A. Mitchell, Trans.). London: MacMillan and Co., Ltd. (Original work published 1907).

Bowlby, J. (1944). Forty-four juvenile thieves: their characters and home-life. International Journal of Psychoanalysis, 25, 19-52 and 107-127.

Bowlby, J. (1951). Maternal care and mental health. World Health Organisation Monograph (Serial No. 2).

Bowlby, J. (1958). The nature of the child's tie to his mother. International Journal of Psychoanalysis, 30, 350-373.

Bowlby, J. (1969/1984). Attachment and loss (Vol. 1): Attachment (2nd ed.). London: Penguin Books.

Bowlby, J. (1973). Attachment and loss, Vol. 2: Separation. New York: Penguin Books.

Bretherton, I. (1987). New perspectives on attachment relations: Security, communication, and internal working models. In J. Osofsky (Ed.), Handbook of infant development (pp. 1061-1100). New York: Wiley.

Bretherton, I., Bates, E., Benigni, L., Camaioni, L., & Volterra V. (1979). Relationships between cognition, communication, and quality of attachment. In E. Bates, L. Benigni, I. Bretherton, L. Camaioni, & V. Volterra (Eds.), The emergence of symbols: Cognition and communication in infancy (pp. 223-269). New York: Academic Press.

Bretherton, I., Biringen, Z., Ridgeway, D., Maslin, M., & Sherman, M. (1989). Attachment: The parental perspective. Infant Mental Health Journal, 10, 203-220.

Brooks, D. N., & Baddeley, A. D. (1976). What can amnesic patients learn? Neuropsychologia, 14, 111-122.

Brooks-Gunn, J., & Lewis, M. (1984). The development of early visual self-recognition. Developmental Review, 4, 215-239.

Bus, A. G., & van IJzendoorn, M. H. (1988a). Mother-child interactions, attachment, and emergent literacy: A cross-sectional study. Child Development, 59, 1262-1272.

Bus, A. G., & van IJzendoorn, M. H. (1988b). Attachment and early reading: A longitudinal study. Journal of Genetic Psychology, 149, 199-210.

Bus, A. G., & van IJzendoorn, M. H. (1992). Patterns of attachment in frequently and infrequently reading mother-child dyads. Journal of Genetic Psychology, 153, 395-403.

Buss, A. H., & Plomin, R. (1984). Temperament: Early developing personality traits. Hillsdale, NJ: Lawrence Erlbaum Associates.

Carroll, L. (1896). Alice's adventures in wonderland and through the looking-glass. London: Dean & Son Ltd.

Cohen, N. J., & Squire, L. R. (1980). Preserved learning and retention of pattern-analyzing skill in amnesia: Dissociation of knowing how and knowing that. Science, 210, 207-210.

Cowan, N., & Davidson, G. (1984). Salient childhood memories. Journal of Genetic Psychology, 145, 101-107.

Diamond, A. (1990). Rate of maturation of the hippocampus and the developmental progression of children's performance on the delayed non-matching to sample and visual paired comparison tasks. In I. A. Diamond (Ed.), The development and neural bases of higher cognitive functions (pp. 394-426). New York: New York Academy of Sciences Press.

Doyle, Sir A. C. (1993). A study in scarlet. In O. D. Edwards (Ed.) The Oxford Sherlock Holmes. Oxford: Oxford University Press. (Original work published 1888).

Dudycha, G. J. D., & Dudycha, M. M. (1941). Childhood memories: A review of the literature. Psychological Review, 38, 668-682.

Dunn, L. M., & Dunn, L. M. (1997). Peabody Picture Vocabulary Test (3rd ed.). Minnesota: American Guidance Service, Inc.

Egeland, B., & Farber, E. A. (1984). Infant-mother attachment: Factors related to its development and changes over time. Child Development, 55, 753-771.

Eisenberg, A. R. (1985). Learning to describe past experiences in conversation. Discourse Processes, 8, 177-209.

Elley, W. B., & Irving, J. C. (1976). Revised socio-economic index for New Zealand. New Zealand Journal of Educational Studies, 11, 25-36.

Engel, S. (1986, April). The role of mother child interaction in autobiographical recall. In J. A. Hudson (Chair), Learning to talk about the past. Symposium conducted at the meeting of the Southeastern Conference on Human Development, Nashville, USA.

Estrada, P., Arsenio, W. F., Hess, R. D., & Holloway, S. D. (1987). Affective quality of the mother-child relationship: Longitudinal consequences for children's school-relevant cognitive functioning. Developmental Psychology, 23, 210-215

Farrar, M. J., Fasig, L. G., Welch-Ross, M. K. (1997). Attachment and emotion in autobiographical memory development. Journal of Experimental Child Psychology, 67, 389-408.

Fenson, L., Dale, P. S., Reznick, J. S., Thal, D., Bates, E., Hartung, J. P., Pethick, S., & Reilly, J. S. (1993). The MacArthur Communicative Development Inventory: Words and Sentences. San Diego, CA: Singular Publishing Group, Inc.

Fivush, R. (1988). The functions of event memory: Some comments on Nelson and Barsalou. In U. Neisser & E. Winograd (Eds.), Remembering reconsidered (pp. 277-282). New York: Cambridge University Press.

Fivush, R. (1991). The social construction of personal narratives. Merrill-Palmer Quarterly, 37, 59-82.

Fivush, R. (1994). Constructing narrative, emotion, and self in parent-child conversations about the past. In U. Neisser, & R. Fivush (Eds.), The remembering self: Construction and accuracy of the self narrative (pp. 136-157). New York: Cambridge University Press.

Fivush, R., & Fromhoff, F. A. (1988). Style and structure in mother-child conversations about the past. Discourse Processes, 11, 337-355.

Fivush, R., Gray, J. T., & Fromhoff, F. A. (1987). Two-year-olds talk about the past. Cognitive Development, 2, 393-409.

Fivush, R., Haden, C. A., & Adams, S. (1995). Structure and coherence of preschoolers' personal narratives over time: Implications for childhood amnesia. Journal of Experimental Child Psychology, 60, 32-56.

Fivush, R., & Haden, C. A. (1997). Narrating and representing experience: Preschoolers' developing autobiographical accounts. In P. van den Broek, P. Bauer, & T. Bourg (Eds.), Developmental spans in event comprehension and representation: Bridging fictional and actual events, (pp. 169-198). New Jersey: Lawrence Erlbaum Associates.

Fivush, R., & Hammond, N. R. (1990). Autobiographical memory across the preschool years: Toward reconceptualising childhood amnesia. In R. Fivush, & J. A. Hudson (Eds.), Knowing and remembering in young children (pp. 223-248). Cambridge, MA: Cambridge University Press.

Fivush, R., & Reese, E. (1992). The social construction of autobiographical memory. In M. A. Conway, D. C. Rubin, H. Spinnler, & W. A. Wagenaar (Eds.), Theoretical perspectives on autobiographical memory (pp. 115-132). Netherlands: Kluwer Academic Publishers.

Frankel, K. A., & Bates, J. E. (1990). Mother-toddler problem-solving: Antecedents in attachment, home behavior, and temperament. Child Development, 61, 810-819.

Freud, S. (1960). Psychopathology of everyday life. In J. Strachey (Ed. and Trans.), The standard edition of the complete psychological works of Sigmund Freud (Vol. 6). London: The Hogarth Press and the Institute of Psychoanalysis. (Original work published 1901).

Freud, S. (1986). A case of hysteria: Three essays on sexuality and other works. In J. Strachey (Ed. and Trans.), The standard edition of the complete

psychological works of Sigmund Freud (Vol. 7). London: The Hogarth Press and The Institute of Psychoanalysis. (Original work published in 1901-1905).

Goldfarb, W. (1943). The effects of early institutional care on adolescent personality. Journal of Experimental Education, 12, 106-129.

Gopnik, A., & Graf, P. (1988). Knowing how you know: Young children's ability to identify and remember the sources of their beliefs. Child Development, 59, 1366-1371.

Haden, C. A. (1998). Reminiscing with different children: Relating maternal stylistic consistency and sibling similarity in talk about the past. Developmental Psychology, 34, 99-114.

Haden, C. A., & Fivush, R. (1996). Contextual variation in maternal conversational styles. Merrill-Palmer Quarterly, 42, 200-227.

Haden, C. A., Haine, R. A., & Fivush, R. (1997). Developing narrative structure in parent-child reminiscing across preschool years. Developmental Psychology, 33, 295-307.

Han, J. J., Leichtman, M. D., & Wang, Q. (1998). Autobiographical memory in Korean, Chinese, and American children. Developmental Psychology, 34, 701-713.

Harlow, H. F. (1961). The development of affectional patterns in infant monkeys. In B. M. Foss (Ed.), Determinants of infant behaviour. (pp. 75-97). London: Methuen & Co. Ltd.

Harlow, H. F., & Zimmermann, R. R. (1958). The development of affectional responses in infant monkeys. Proceedings of the American Philosophical Society, 102, 501-509.

Hirschman, L. (1994). Female-male differences in conversational interaction. Language in Society, 23, 427-442.

Howe, M. L., & Courage, M. L. (1993). On resolving the enigma of infantile amnesia. Psychological Bulletin, 113, 305-326.

Howes, C., & Hamilton, C. E. (1992). Children's relationships with child care teachers: Stability and concordance with parental attachments. Child Development, 63, 867-878.

Hudson, J. A. (1990). The emergence of autobiographical memory in mother-child conversation. In R. Fivush & J. Hudson (Eds.), Knowing and remembering in young children (pp. 166-196). New York: Cambridge University Press.

Hudson, J. A. (1993). Reminiscing with mothers and others: Autobiographical memory in young two-year-olds. Journal of Narrative and Life History, 3, 1-32.

Hudson, J. A., & Shapiro, L. R. (1991). From knowing to telling: The development of children's scripts, stories, and personal narratives. In A. McCabe & C. Peterson. (Eds.), Developing narrative structure (pp. 89 -136). Hillsdale, NJ: Lawrence Erlbaum Associates.



Kuebli, J., Butler, S., & Fivush, R. (1995). Mother-child talk about past event emotions: Relations of maternal language and child gender over time. Cognition and Emotion, 9, 265-283.

Lamb, M. E., Thompson, R. A., Gardner, W., Charnov, E. L. (1985). Infant-mother attachment: The origins and developmental significance of individual differences in Strange Situation behavior. New Jersey: Lawrence Erlbaum Associates.

Lay, K., Waters, E., Posada, G., & Ridgeway, D. (1995). Attachment security, affect regulation, and defensive responses to mood induction. In E. Waters, B. E. Vaughn, G. Posada, & K. Kondo-Ikemura (Eds.), Caregiving, cultural, and cognitive perspectives on secure-base behavior and working models: New growing points of attachment theory. Monographs of the Society for Research in Child Development, 60, (2-3, Serial No. 244), 179-196.

Lewis, M., & Brooks-Gunn, J. (1979). Social cognition and the acquisition of self. New York: Plenum.

Lewis, M., Brooks-Gunn, J., & Jaskir, J. (1985). Individual differences in visual self-recognition as a function of mother-infant attachment relationship. Developmental Psychology, 21, 1181-1187.

Lorenz, K. Z. (1937). The companion in the bird's world. Auk, 54, 245-273.

MacDonald, S. D. (1997). The role of socialisation in autobiographical memory in children and adults: A vygotskian perspective. Unpublished Ph.D. manuscript. University of Otago, Dunedin, New Zealand.

MacDonald, S., & Hayne, H. (1996). Child-initiated conversations about the past and memory performance by preschoolers. Cognitive Development, 11, 421-442.

MacDonald, S., Uesiliana, K., & Hayne, H. (1999). Cross-cultural differences in childhood amnesia. Manuscript submitted for publication.

Main, M. (1983). Exploration, play, and cognitive functioning related to infant-mother attachment. Infant Behavior and Development, 6, 167-174.

Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. In I. Bretherton, & E. Waters (Eds.), Growing points of attachment theory and research. Monographs of the Society for Research in Child Development, 50, (1-2, Serial No. 209), 66-104.

Main, M., & Solomon, J. (1986). Discovery of an insecure-disorganized/disoriented attachment pattern. In M. Yogman, & T. B. Brazelton (Eds.), Affective development in infancy, (pp. 95-124). Norwood, NJ: Ablex.

Mandler, J. M. (1990). Recall and its verbal expression. In R. Fivush, & J. A. Hudson (Eds.), Knowing and remembering in young children (pp. 317-350). New York: Cambridge University Press.

Matas, L., Arend, R. A., & Sroufe, L. A. (1978). Continuity of adaptation in the second year: The relationship between quality of attachment and later competence. Child Development, 49, 547-556.

McCabe, A., & Peterson, C. (1991). Getting the story: A longitudinal study of parental styles in eliciting narratives and developing narrative skill. In A. McCabe,

& C. Peterson (Eds.), Developing narrative structure (pp. 217-257). Hillsdale, NJ: Lawrence Erlbaum Associates.

McDonough, L., Mandler, J. M., McKee, R. D., & Squire, L. R. (1995). The deferred imitation task as a nonverbal measure of declarative memory. Proceedings of the National Academy of Science, *92*, 7580-7584.

Meins, E. (1997). Security of attachment and maternal tutoring strategies: Interaction within the zone of proximal development. British Journal of Developmental Psychology, *15*, 129-144.

Meins, E. (1998). The effects of security of attachment and maternal attribution of meaning on children's linguistic acquisitional style. Infant Behavior and Development, *21*, 237-252.

Meltzoff, A. N. (1988). Infant imitation and memory: Nine-months-olds in immediate and deferred tests. Child Development, *59*, 217-225.

Meltzoff, A. N. (1995). What infant memory tells us about infantile amnesia: Long-term recall and deferred imitation. Journal of Experimental Child Psychology, *59*, 497-515.

Miller, P. J., & Sperry, L. (1988). Early talk about the past: The origins of conversational stories of personal experience. Journal of Child Language, *15*, 293-315.

Mitchell, J. (1986). The selected Melanie Klein. London: Penguin Books.

Moore, C., Angelopoulos, M., & Bennett, P. (1999). Word learning in the context of referential and salience cues. Developmental Psychology, *35*, 60-68.

Moran, G., Pederson, D. R., Pettit, P., & Krupka, A. (1992). Maternal sensitivity and infant-attachment in a developmentally delayed sample. Infant Behavior and Development, 15, 427-442.

Morisset, C. E., Banard, K. E., Greenberg, M. T., Booth, C. L., & Spieker, S. J. (1990). Environmental influences on early language development: The context of social risk. Development and Psychopathology, 2, 127-149.

Moss, E., Parent, S., Gosselin, C., & Dumont, M. (1993). Attachment and the development of metacognitive and collaborative strategies. International Journal of Educational Research, 19, 555-571.

Mullen, M. K. (1994). Earliest recollections of childhood: A demographic analysis. Cognition, 52, 55-79.

Mullen, M. K., & Yi, S. (1995). The cultural context of talk about the past: Implications for the development of autobiographical memory. Cognitive Development, 10, 407-419.

Nadel, L., & Zola-Morgan, S. (1984). Infantile amnesia: A neurobiological perspective. In M. Moscovitch (Ed.), Infant Memory (pp. 145-172). New York: Plenum Press.

Neisser, U. (1962). Cultural and cognitive discontinuity. In T. E. Gladwin, & W. Sturtevant (Eds.), Anthropology and Human Behavior (pp. 54-71). Washington, DC: Anthropological Society of Washington.

Nelson, K. (1988). The ontogeny of memory for real events. In U. Neisser & E. Winograd (Eds.), Remembering reconsidered: Ecological and traditional

approaches to the study of memory (pp. 244-276). Cambridge: Cambridge University Press.

Nelson, K. (1993). The psychological and social origins of autobiographical memory. Psychological Science, 1, 1-8.

Nelson, K. (1996). Language in cognitive development: Emergence of the mediated mind. New York: Cambridge University Press.

Nelson, K. & Ross, G. (1980). The generalities and specifics of long-term memory in infants and young children. In M. Perlmutter (Ed.), Children's memory: New Directions for Child Development, Vol. 10, (pp. 87-101). San Francisco: Jossey-Bass.

Overman, W. H. (1990). Performance on traditional matching to sample, non-matching to sample, and object discrimination tasks by 12- to 32-month-old children: A developmental progression. In A. Diamond (Ed.), The development and neural bases of higher cognitive functions: Vol. 608, Annals of the New York Academy of Sciences (pp. 365-385). New York: New York Academy of Sciences Press.

Park, K., & Waters, E. (1989). Security of attachment and preschool friendships. Child Development, 60, 1076-1081.

Pederson, D. R., Moran, G., Sitko, C., Campbell, K., Ghesquire, K., & Acton, H. (1990). Maternal sensitivity and the security of infant-mother attachment: A q-sort study. Child Development, 61, 1974-1983.

Perner, J. (1991). Understanding the representational mind. Cambridge, MA: MIT Press.

Perner, J., & Ruffman, T. (1995). Episodic memory and autonoetic consciousness: Developmental evidence and a theory of childhood amnesia. Journal of Experimental Child Psychology, 59, 516-548.

Peterson, C., Jesso, B., & McCabe, A. (1999). Encouraging narratives in preschoolers: A intervention study. Journal of Child Language, 26, 49-67.

Peterson, C., & McCabe, A. (1992). Parental styles of narrative elicitation: Effect on children's narrative structure and content. First Language, 12, 299-321.

Peterson, C., & McCabe, A. (1994). A social interactionist account of developing decontextualized narrative skill. Developmental Psychology, 30, 937-948.

Pillemer, D. B., & White, S. H. (1989). Childhood events recalled by children and adults. In W. H. Reese. (Ed.), Advances in child development and behavior (pp. 297-340). San Diego, CA: Academic Press.

Pipp, S., Fisher, K. W., & Jennings, S. (1987). Acquisition of self. Developmental Psychology, 23, 86-96.

Posada, G., Gao, Y., Wu, F., Posada, R., Tascon, M., Schoelmerich, A., Sagi, A., Kondo-Ikemura, K., Haaland, W., & Synnevaag, B. (1995). The secure-base phenomenon across cultures: Children's behavior, mothers' preferences, and experts' concepts. In E. Waters, B. E. Vaughn, G. Posada, & K. Kondo-Ikemura (Eds.), Caregiving, cultural, and cognitive perspectives on secure-base behavior

and working models: New growing points of attachment theory. Monographs of the Society for Research in Child Development, 60, (2-3, Serial No. 244), 27-48.

Povinelli, D. (1995). The unduplicated self. In P. Rochat (Ed.) The self in early infancy, (pp. 161-192). Amsterdam: North Holland-Elsevier.

Ratner, H. H. (1984). Memory demands and the development of young children's memory. Child Development, 55, 2173-2191.

Reese, E., & Brown, N. (in press). Reminiscing and recounting in the preschool years. Applied Cognitive Psychology.

Reese, E., & Fivush, R. (1993). Parental styles of talking about the past. Developmental Psychology, 29, 596-606.

Reese, E., Haden, C. A., & Fivush, R. (1993). Mother-child conversations about the past: Relationships of style and memory over time. Cognitive Development, 8, 403-430.

Reese, E., Haden, C. A., & Fivush, R. (1996). Mothers, fathers, daughters, sons: Gender differences in autobiographical reminiscing. Research on Language and Social Interaction, 29, 27-56.

Reese, E., & Read, S. (in press). Predictive validity of the New Zealand MacArthur Communicative Development Inventory: Words and Sentences. Journal of Child Language.

Rogoff, B. (1990). Apprenticeship in thinking: Cognitive development in social context. Oxford: Oxford University Press.

Ross, M., & Holmberg, D. (1990). Recounting the past: Gender differences in recall of events in the history of a close relationship. In J. M. Olson & M. P. Zanna (Eds.), Self-inference processes: The Ontario Symposium, Vol. 6, (pp. 135-152). Hillsdale, NJ: Lawrence Erlbaum Associates.

Rovee-Collier, C. (1993). The capacity for long-term memory in infancy. Current Directions in Psychological Science, 2, 130-135.

Rovee-Collier, C., & Hayne, H. (1987). Reactivation of infant memory: Implications for cognitive development. Advances in Child Development and Behavior, 20, 185-238.

Sachs, J. (1983). Talking about the there and then: The emergence of displaced reference in parent-child discourse. In K. E. Nelson (Ed.), Children's language (Vol. 4, pp. 1-27). New York: Gardner Press.

Schacter, E. G. (1947). On memory and childhood amnesia. Psychiatry, 10, 1-26.

Schneider-Rosen, K., Braunwald, K. G., Carlson, V., & Cicchetti, D. (1985) Current perspectives in attachment theory: Illustration from the study of maltreated infants. In I. Bretherton, & E. Waters (Eds.), Growing points of attachment theory and research. Monographs of the Society for Research in Child Development, 50 (1-2, Serial No. 209), 194-210.

Scoville, W. B., & Milner, B. (1957). Loss of recent memory after bilateral hippocampal lesion. Journal of Neurology, Neurosurgery, and Psychiatry, 20, 11-21.



Squire, L. R. (1992). Memory and the hippocampus: A synthesis from findings with rats, monkeys, and humans. Psychological Review, 99, 195-231.

Squire, L. R., Knowlton, B., & Musen, G. (1993). The structure and organisation of memory. Annual Review of Psychology, 44, 453-495.

Srayton, D. J., & Ainsworth, M. D. S. (1973). Individual differences in infant responses to brief, everyday separations as related to other infant and maternal behaviors. Developmental Psychology, 9, 226-235.

Tabachnick, B. G., & Fidell, L. S. (1996). Using multivariate statistics. (3rd ed.). New York: Harper Collins Publishers, Inc.

Tannen, D. (1994). Gender and discourse. New York: Oxford University Press.

Tessler, M., & Nelson, K. (1994). Making memories: The influence of joint encoding on later recall by young children. Consciousness and Cognition, 3, 307-326.

Teti, D. M., & McGourty, S. (1996). Using mothers versus trained observers in assessing children's secure base behavior: Theoretical and methodological considerations. Child Development, 67, 597-605.

Teti, D. M., Nakagawa, M., Das, R., & Wirth, O. (1991). Security of attachment between preschoolers and their mothers: Relations among social interaction, parenting stress, and mothers' sorts of the attachment q-set. Developmental Psychology, 27, 440-447.

Thompson, R. A., Lamb, M. E., & Estes, D. (1982). Stability of infant-mother attachment and its relationship to changing life circumstances in an unselected middle-class sample. Child Development, *53*, 144-148.

Tomasello, M., & Farrar, J. (1986). Joint attention and early language. Child Development, *57*, 1454-1463.

Tulving, E. (1972). Episodic and semantic memory. In E. Tulving, & W. Donaldson (Eds.), Organization of memory (pp. 381-402). New York: Academic Press.

van Dam, M., & van IJzendoorn, M. H. (1988). Measuring attachment security: Concurrent and predictive validity of the parental attachment q-set. Journal of Genetic Psychology, *149*, 447-457.

van der Veer, R., & van IJzendoorn, M. H. (1988). Early childhood attachment and later problem-solving: A vygotskian perspective. In J. Valsiner (Ed.), Child Development within culturally structured environments: Vol. 1. Parental cognition and adult-child interaction, (pp. 215-246). New Jersey: Ablex Publishing Corporation.

van IJzendoorn, M. H., Dijkstra, J., & Bus A. G. (1995). Attachment, intelligence, and language: A meta-analysis. Social Development, *4*, 115-128.

van IJzendoorn, M. H., & van Vliet-Visser, S. (1988). The relationship between quality of attachment in infancy and IQ in kindergarten. Journal of Genetic Psychology, *149*, 23-28.

van IJzendoorn, M. H., Vereijken, C. M. J. L., & Riksen-Walraven, M. J. M. A. (in press). Is the attachment q-sort a valid measure of attachment security in young children. In B. E. Vaughn, & E. Waters (Eds.), Patterns of secure base behaviour: Q-sort perspectives on attachment and caregiving. Hillsdale, N.J.: Erlbaum.

Vaughn, B., Egeland, B., Sroufe, L. A., & Waters, E. (1979). Individual differences in infant-mother attachment at twelve and eighteen months: Stability and change in families under stress. Child Development, 50, 971-975.

Vaughn, B. E., & Waters, E. (1990). Attachment behavior at home and in the laboratory: Q-sort observations and strange situation classifications of one-year-olds. Child Development, 61, 1965-1973.

Vygotsky, L. S. (1978). Mind in society. Cambridge, MA: Harvard University Press

Waldfoegel, S. (1948). The frequency and affective character of childhood memories. Psychological Monographs, 62, 11-39.

Waters, E. (1978). The reliability and stability of individual differences in infant-mother attachment. Child Development, 49, 483-494.

Waters, E. (1987). Attachment Behavior Q-set (Version 3.0). Unpublished instrument, State University of New York at Stony Brook, Department of Psychology.

Waters, E., & Deane, K. E. (1985). Defining and assessing individual differences in attachment relationships: Q-methodology and the organisation of

behavior in infancy and early childhood. In I. Bretherton & E. Waters (Eds.), Growing points of attachment theory and research. Monographs of the Society for Research in Child Development, 50, (1-2, Serial No. 209), 41-65.

Weiland, H., & Steisel, I. M. (1958). An analysis of manifest content of the earliest memories of children. Journal of Genetic Psychology, 92, 41-52.

Welch-Ross, M. K. (1995). An integrative model of the development of autobiographical memory. Developmental Review, 15, 338-365.

Welch-Ross, M. K. (1997). Mother-child participation in conversation about the past: Relationships to preschoolers' theory of mind. Developmental Psychology, 33, 618-629.

Welch-Ross, M. (1999a). Personalizing the temporally extended self: Evaluative self-awareness and the development of autobiographical memory. Manuscript in preparation.

Welch-Ross, M. K. (1999b, April). A Social-constructivist View on Self-understanding and its Relation to Autobiographical Memory. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Albuquerque, NM.

White, S. H., & Pillemer, D. B. (1979). Childhood amnesia and the development of a socially accessible memory system. In J. F. Kihlstrom, & F. J. Evans (Eds.), Functional disorders of memory (pp. 29-73). New York: Wiley.

Williams, K. T. (1997). Expressive Vocabulary Test. Minnesota: American Guidance Service, Inc.

Zola-Morgan, S., & Squire, L. R. (1984). Preserved learning in monkeys with medial temporal lesions: Sparing of motor and cognitive skills. Journal of Neuroscience, 4, 1072-1085.

## Appendix A

### Attachment Behavior Q-Set (Version 3.0)

Everett Waters (1987)

1. Child readily shares with mother or lets her hold things if she asks to.

*Low: Refuses.*

2. When child returns to mother after playing, he is sometimes fussy for no clear reason.

*Low: Child is happy or affectionate when he returns to mother between or after play times.*

3. When he is upset or injured, child will accept comforting from adults other than mother.

*Low: Mother is the only one he allows to comfort him.*

4. Child is careful and gentle with toys and pets.

5. Child is more interested in people than in things.

*Low: More interested in things than people.*

6. When child is near mother and sees something he wants to play with, he fusses or tries to drag mother over to it.

*Low: Goes to what he wants without fussing or dragging mother along.*

7. Child laughs and smiles easily with a lot of different people.

*Low: Mother can get him to smile or laugh more*

8. When child cries, he cries hard.

*Low: Weeps, sobs, doesn't cry hard, or hard crying never lasts very long.*

9. Child is lighthearted and playful most of the time.

*Low: Child tends to be serious, sad, or annoyed a good deal of the time.*

10. Child often cries or resists when mother takes him to bed for naps or at night.

11. Child often hugs or cuddles against mother, without her asking or inviting him to do so.

*Low: Child doesn't hug or cuddle much, unless mother hugs him first or asks him to give her a hug.*

12. Child quickly gets used to people or things that initially made him shy or

frightened him.

*Middle: If never shy or afraid.*

13. When the child is upset by mother's leaving, he continues to cry or even gets angry after she is gone.

*Middle: If not upset by mom leaving.*

*Low: Cry stops right after mom leaves.*

14. When child finds something new to play with, he carries it to mother or shows it to her from across the room.

*Low: Plays with the new object quietly or goes where he won't be interrupted.*

15. Child is willing to talk to new people, show them toys, or show them what he can do, if mother asks him to.

16. Child prefers toys that are modelled after living things (e.g. dolls, stuffed animals).

*Low: Prefers balls, blocks, pots and pans, etc.*

17. Child quickly loses interest in new adults if they do anything that annoys him.

18. Child follows mother's suggestions readily, even when they are clearly suggestions rather than orders.

*Low: Ignores or refuses unless ordered.*

19. When mother tells child to bring or give her something, he obeys.

(Do not count refusals that are playful or part of a game unless they are clearly disobedient).

*Low: Mother has to take the object or raise her voice to get it away from him.*

20. Child ignores most bumps, falls, or startles.

*Low: Cries after minor bumps, falls, or startles.*

21. Child keeps track of mother's location when he plays around the house.

Calls to her now and then. Notices her go from room to room. Notices if she changes activities

*Middle: If child isn't allowed or doesn't have room, to play away from mom.*

*Low: Doesn't keep track.*

22. Child acts like an affectionate parent toward dolls, pets, or infants.

*Middle: If child doesn't play with or have access to dolls, pets, or infants.*

*Low: Plays with them in other ways.*

23. When mother sits with other family members, or is affectionate with them, child tries to get mom's affection for himself.

*Low: Lets her be affectionate with others. May join in but not in a jealous way.*

24. When mother speaks firmly or raises her voice at him, child becomes upset, sorry, or ashamed about displeasing her.

(Do not score high if child is simply upset by the raised voice or afraid of getting punished).

25. Child is easy for mother to lose track of when he is playing out of her sight.

*Middle: If never plays out of sight.*

*Low: Talks and calls when out of sight. Easy to find; easy to keep track of what he is doing.*

26. Child cries when mother leaves him at home with baby-sitter, father, or grandparent.

*Low: Doesn't cry with any of these.*

27. Child laughs when mother teases him.

*Middle: If mother never teases child during play or conversations.*

*Low: Annoyed when mother teases him.*

28. Child enjoys relaxing in mother's lap.

*Middle: If child never sits still.*

*Low: Prefers to relax on the floor or on furniture.*

29. At times, child attends so deeply to something that he doesn't seem to hear when people speak to him.

*Low: Even when deeply involved in play, child notices when people speak to him.*

30. Child easily becomes angry with toys.

31. Child wants to be the center of mother's attention. If mom is busy or talking to someone, he interrupts.

*Low: Doesn't notice or doesn't mind not being the center of mother's attention.*

32. When mother says "No" or punishes him, child stops misbehaving (at least at that time). Doesn't have to be told twice.

33. Child sometimes signals mother (or gives the impression) that he wants to be put down, and then fusses or wants to be picked right back up.

*Low: Always ready to go play by the time he signals mother to put him down.*



34. When child is upset about mother leaving him, he sits right where he is and cries  
Doesn't go after her.  
*Middle: If never upset by her leaving.*  
*Low: Actively goes after her if he is upset or crying.*
35. Child is independent with mother    Prefers to play on his own; leaves mother easily when he wants to play.  
*Middle: Allowed or not enough room to play.*  
*Low: Prefers playing with or near mother.*
36. Child clearly shows a pattern of using mother as a base from which to explore.  
Moves out to play; Returns or plays near her; Moves out to play again, etc.  
*Low: Always away unless retrieved, or always stays near.*
37. Child is very active. Always moving around. Prefers active games to quiet ones.
38. Child is demanding and impatient with mother. Fusses and persists unless she does what he wants right away.
39. Child is often serious and businesslike when playing away from mother or alone with his toys.  
*Low: Often silly or laughing when playing away from mother or alone with his toys.*
40. Child examines new objects or toys in great detail    Tries to use them in different ways or to take them apart.  
*Low: First look at new objects or toys is usually brief (May return to them later however.)*
41. When mother says to follow her, child does so.  
(Do not count refusals or delays that are playful or part of a game unless they clearly become disobedient).
42. Child recognizes when mother is upset. Becomes quiet or upset himself Tries to comfort her    Asks what is wrong, etc.  
*Low: Doesn't recognize; continues play; behaves toward her as if she were OK.*
43. Child stays closer to mother or returns to her more often than the simple task of keeping track of her requires.  
*Low: Doesn't keep close track of mother's location or*
44. Child asks for and enjoys having mother hold, hug, and cuddle him.  
*Low: Not especially eager for this. Tolerates It but doesn't seek it; or wiggles to*

*be put down.*

45. Child enjoys dancing or singing along with music.

*Low: Neither likes nor dislikes music.*

46. Child walks and runs around without bumping, dropping, or stumbling.

*Low: Bumps, drops, or stumbles happen throughout the day (even if no injuries result).*

47. Child will accept and enjoy loud sounds or being bounced around in play, if mother smiles and shows that it is supposed to be fun.

*Low: Child gets upset, even if mother indicates the sound or activity is safe or fun.*

48. Child readily lets new adults hold or share things he has, if they ask to.

49. Runs to mother with a shy smile when new people visit the home.

*Middle: If child doesn't run to mother at all when visitors arrive.*

*Low: Even if he eventually warms up to visitors, child initially runs to mother with a fret or a cry.*

50. Child's initial reaction when people visit the home is to ignore or avoid them, even if he eventually warms up to them.

51. Child enjoys climbing all over visitors when he plays with them.

*Middle: If he won't play with visitors.*

*Low: Doesn't seek close contact with visitors when he plays with them.*

52. Child has trouble handling small objects or putting small things together.

*Low: Very skillful with small objects, pencils, etc.*

53. Child puts his arms around mother or puts his hand on her shoulder when she picks him up.

*Low: Accepts being picked up but doesn't especially help or hold on.*

54. Child acts like he expects mother to interfere with his activities when she is simply trying to help him with something.

*Low: Accepts mother's help readily, unless she is in fact interfering*

55. Child copies a number of behaviors or way of doing things from watching mother's behavior.

*Low: Doesn't noticeably copy mother's behavior.*

56. Child becomes shy or loses interest when an activity looks like it might be difficult.

*Low: Thinks he can do difficult tasks.*

57. Child is fearless.

*Low: Child is cautious or fearful.*

58. Child largely ignores adults who visit the home. Finds his own activities more interesting.

*Low: Finds visitors quite interesting, even if he is a bit shy at first.*

59. When child finishes with an activity or toy, he generally finds something else to do without returning to mother between activities.

*Low: When finished with an activity or toy, he returns to mother for play, affection or help finding more to do.*

60. If mother reassures him by saying "It's OK" or "It won't hurt you", child will approach or play with things that initially made him cautious or afraid.

*Middle: If never cautious or afraid.*

61. Plays roughly with mother Bumps, scratches, or bites during active play. (Does not necessarily mean to hurt mom)

*Middle: If play is never very active .*

*Low: Plays active games without injuring mother.*

62. When child is in a happy mood, he is likely to stay that way all day.

*Low: Happy moods are very changeable.*

63. Even before trying things himself, child tries to get someone to help him.

64. Child enjoys climbing all over mother when they play.

*Low: Doesn't especially want a lot of close contact when they play.*

65. Child is easily upset when mother makes him change from one activity to another.

(Even if the new activity is something child often enjoys.)

66. Child easily grows fond of adults who visit his home and are friendly to him.

*Low: Doesn't grow fond of new people very easily.*

67. When the family has visitors, child wants them to pay a lot of attention to him.

68. On the average, child is a more active type person than mother

*Low: On the average, child is less active type person than mother is.*

69. Rarely asks mother for help.

*Middle: If child is too young to ask.*

*Low: Often asks mother for help.*

70. Child quickly greets his mother with a big smile when she enters the room.

(Shows her a toy, gestures, or says "Hi, Mommy")

*Low: Doesn't greet mother unless she greets him first.*

71. If held in mother's arms, child stops crying and quickly recovers after being frightened or upset.

*Low: Not easily comforted*

72. If visitors laugh at or approve of something the child does, he repeats it again and again.

*Low: Visitors' reactions don't influence child this*

73. Child has a cuddly toy or security blanket that he carries around, takes to bed, or holds when upset.

(Do not include bottle or pacifier if child is under two years old.)

*Low: Can take such things or leave them, or has none at all.*

74. When mother doesn't do what child wants right away, he behaves as if mom were not going to do it at all.

(Fusses, gets angry, walks off to other activities, etc.)

*Low: Waits a reasonable time, as he expects mother will shortly do what he asked.*

75. At home, child gets upset or cries when mother walks out of the room.

(May or may not follow her.)

*Low: Notices her leaving; may follow but doesn't get, upset.*

76. When given a choice, child would rather play with toys than with adults.

*Low: Would rather play with adults than toys.*

77. When mother asks child to do something, he readily understands what she wants (May or may not obey.)

*Middle: If too young to understand*

*Low: Sometimes puzzled or slow to understand what mother wants.*

78. Child enjoys being hugged or held by people other than his parents and/or grandparents.

79. Child easily becomes angry at mother.

*Low: Doesn't become angry at mother unless she is very intrusive or he is very tired.*

80. Child uses mother's facial expressions as good source of information when something looks risky or threatening.

*Low: Makes up his own mind without checking mother's expressions first.*

81. Child cries as a way of getting mother to what he wants.

*Low: Mainly cries because of genuine discomfort (tired, sad, afraid, etc.).*

82. Child spends most of his play time with just a few favorite toys or activities.

83. When child is bored, he goes to mother looking for something to do.

*Low: Wanders around or just does nothing for a while, until something comes up.*

84. Child makes at least some effort to be clean and tidy around the house.

*Low: Spills and smears things on himself and on floors all the time.*

85. Child is strongly attracted to new activities and new toys.

*Low: New things do not attract him away from familiar toys or activities.*

86. Child tries to get mother to imitate him, or quickly notices and enjoys it when mom imitates him on her own.

87. If mother laughs at or approves of something the child has done, he repeats again and again.

*Low: Child is not particularly influenced this way.*

88. When something upsets the child, he stays where he is and cries.

*Low: Goes to mother when he cries. Doesn't wait for mom to come to him.*

89. Child's facial expressions are strong and clear when he is playing with something.

90. If mother moves very far, child follows along and continues his play in the area she has moved to.

*(Doesn't have to be called or carried along; doesn't stop play or get upset.)*

*Middle: If child isn't allowed or doesn't have room to move very far away.*

## Appendix B

### Correlations Between Maternal and Child Conversational Variables (Not Included in the Text)

Maternal Variables	Child Variables							
	MR19	MR25	MR32	MR40	OFF19	OFF25	OFF32	OFF40
MQ-ELAB19	.41**	.26*	.02	-.21	.34**	.22	.16	.16
MQ-ELAB25	.12	.52**	.13	.01	.15	.26	-.04	.23
MQ-ELAB32	.20	.26*	.36**	.03	.25	.08	.10	.22
MQ-ELAB40	.07	.33*	.15	.28*	.16	.06	.05	.23
YN-ELAB19	.39**	.28*	.01	.07	.36**	.17	.22	.19
YN-ELAB25	.110	.35**	.12	-.05	-.11	-.03	.02	.16
YN-ELAB32	-.01	.17	.16	.12	-.17	-.04	-.23	.00
YN-ELAB40	-.04	.23	.15	.27*	-.05	-.30*	.03	.17
ST-ELAB19	.33*	.22	.09	-.01	.37**	.05	.18	-.01
ST-ELAB25	.05	.18	-.03	-.10	-.10	-.07	-.12	-.06
ST-ELAB32	.22	.16	.03	.13	.12	-.15	-.23	.05
ST-ELAB40	.04	-.11	-.02	.26*	-.10	.01	-.11	.02
REPS19	.44**	.27*	.17	-.09	.61**	.23	.28*	.27*
REPS25	.08	.20	.10	.02	.11	.27*	.21	.28*
REPS32	.04	.14	.42**	.10	.12	.24	.55**	.29*
REPS40	.09	.06	.11	.47**	.11	.05	.17	.43**
CONF19	.78**	-.06	-.17	.03	.49**	.03	-.03	.08
CONF25	.18	.65**	.12	-.22	.14	.10	-.07	.02
CONF32	.26	.28*	.58**	.08	.22	.08	.02	.06
CONF40	.16	.09	.29*	.36**	.13	.06	.01	.01

\* $p < .05$ . \*\*  $p < .01$ .

## Appendix C

### Correlations between Maternal Repetitions and Children's Memory

#### Elaborations and Placeholders

Child Variables	Maternal Variables			
	REPS19	REPS25	REPS32	REPS40
ME19	.34**	-.04	-.04	.04
ME25	.13	.13	.13	-.04
ME32	.39**	.18	.18	.09
ME40	.12	.06	.06	.47**
PL19	.36**	.35**	.18	.23
PL25	.08	.29*	.21	.10
PL32	.20	.17	.10	.15
PL40	.21	.07	.25	.28*

\* $p < .05$ . \*\*  $p < .01$ .